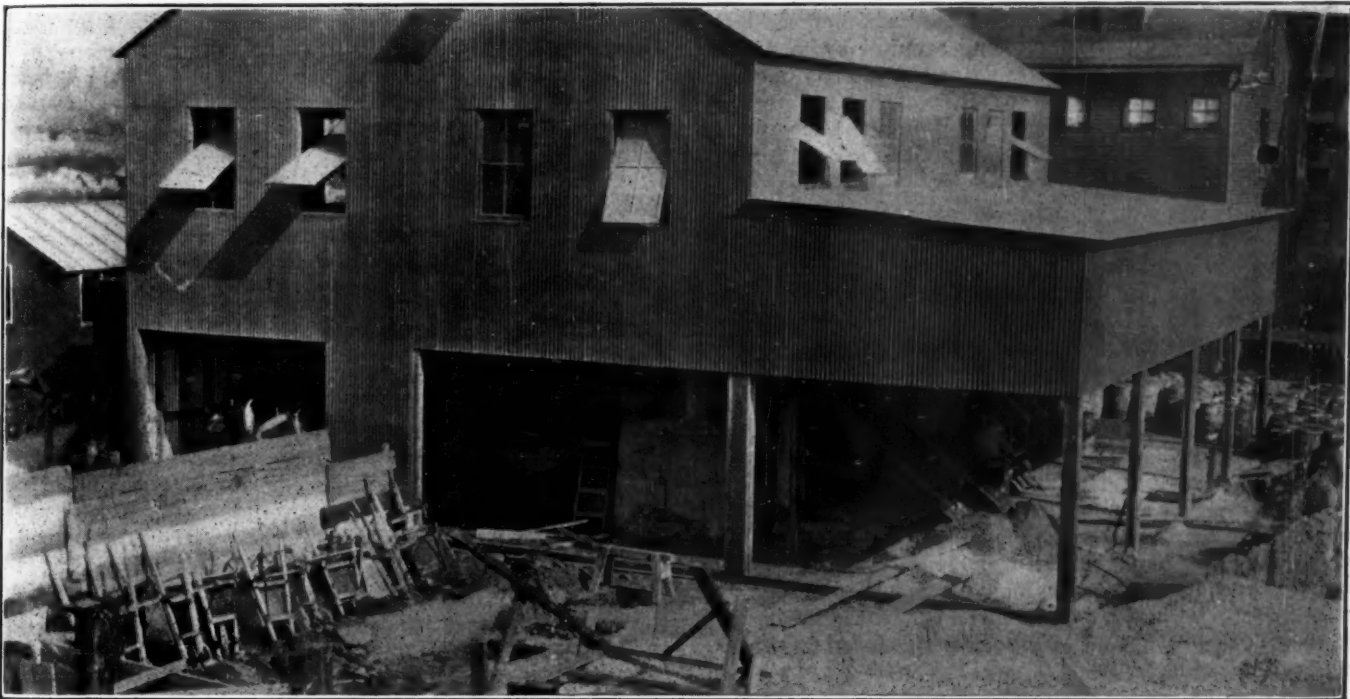


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BRONX BOROUGH ASPHALT PLANT.

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Municipal Plant Completed About a Month Ago—Construction and Plant Details—Force Used at Plant and on Street—Motor Truck for Hauling Hot Material to Street.

Previous to the season of 1915, all asphalt repairing in Bronx Borough, New York City, including patching and resurfacing, was done by a private concern under contract, though maintenance work on granite, asphalt block and wood block pavements and macadam was done by gangs sent out by the Bureau of Maintenance.

Believing that repairs for asphalt pavements could be done better and more cheaply by the borough, John P. Binzen, engineer in charge of maintenance work for the borough, made plans for a plant of sufficient capacity to furnish asphalt for all repair work. The contract for the complete plant was awarded to the F. D. Cummer & Son Co. Construction of the foundation was started early in the spring and the plant was furnished complete and ready to put in operation about the 1st of June.

The site selected for the plant was on Edgewater road, near the intersection of Garrison avenue, and on the Bronx river. This is a fairly central location and has the advantages of water transportation, scows carrying

sand, stone and asphalt directly to the plant, where they are unloaded by the department forces. The land at this point was low and marshy and a fill of about four feet was necessary to bring it to the street level and to secure a firm surface. Material for the fill was obtained from the contractors at work on the new subway.

On account of the nature of the ground it was impossible to construct a loading pit so that the wagons might be driven under the mixing platform, so the drying and mixing unit of the plant was set on reinforced concrete piers rising about five feet above the ground surface. These piers were sunk down nearly to the surface of the original soil and the footings so extended that the loading did not exceed 700 pounds per square foot. On the top, grooves were left in which the wheels of the plant were placed. It was necessary also to support the building, which is a frame structure sheathed with corrugated iron and about 40 feet square, on concrete piers. In this work, the loading was kept within the limit above

given. An office and testing laboratory building also is being constructed, as is a small building containing shower baths, lockers, etc., for the workmen.

The plant selected was a Cummer portable road asphalt plant with a rated capacity of 750 square yards of surfacing per day. Power for running the plant is furnished by a 25-h.p. motor direct connected. A 1½-h.p. motor operates a hoist by which the barrels of asphaltic cement are raised to the level of the mixing platform, whence they are dumped into the special asphalt melting kettle. There is only one kettle, but this holds a supply of ten tons, which is ample for the demands of one day. A 2-inch pipe line, jacketed with a 4-inch steam line to keep the material at the proper temperature, carries the asphaltic cement to the weighing bucket. When the valve to the weighing bucket is closed the asphaltic cement returns to the mixing tank by another similarly heated pipe line, circulation being secured by means of a Kinney oil pump. This circulatory motion is believed to insure a perfect mix, keep the material in the feed pipe at the proper temperature and prevent any possibility of burning in the tank. Steam for the pipe lines is generated in a small upright boiler.

The plant was put in operation about June 1st and at that time was subjected by Mr. Binzen to a one-hour test run, during which 41 boxes of five cubic feet each were turned out. Ordinarily the plant is not run to capacity, as the 50 miles of asphalt streets now out of guarantee in the borough do not require more than 500 yards daily for maintenance. Also, since the work was started a little later than usual, most attention is still being paid to patching and, the patches being small, the two crews now employed are unable to lay more than 300 or 400 yards per day.

Seven men, including the foreman, are required to operate the plant. These are employed as follows: One general utility man, two men shoveling sand and stone on the bucket conveyor which carries the material to the heating drum, one fireman, one man at the heating tank and two men, one of whom is the foreman, on the mixing platform.

To check the time required by the teamsters to deliver the loads and to record, under proper heads, the divisions of the work done, a system of accounting devised by Mr. Binzen is used. When a team is loaded and ready to leave the plant, the driver is given a slip on which is recorded the weight of the load, whether binder or surfacing, the number of the truck and the time of departure. The gang foreman on the work takes up this slip and records the time of arrival. Similar records are kept of the time required to unload and return to the plant. Duplicates of all slips are made on carbon.

Material is hauled in five Watson trucks and in one Mack 5-ton motor truck, all of which are owned by the bureau. Teams are hired at \$6 per day. The regular load for a truck is 7,440 pounds of surfacing or 7,680 pounds

of binder. The usual load for the Mack truck is 11,500 pounds, but when more material is needed it is regularly loaded with 15,360 pounds of asphalt. This truck has proven very economical in hauling, especially on large jobs, where the whole load may be dumped at once.

Top coats for resurfacing or patching are mixed in the proportion 450 pounds of sand, 100 pounds of lime dust and 70 pounds of asphaltic cement. For the binder coat the proportions are: ¾-inch stone, 450 pounds; sand, 100 pounds; asphaltic cement, 40 pounds. The batches are mixed in the machine for one minute on the average. Sand temperature is kept at about 340 degrees F., and the asphaltic cement at 280 degrees. While on the way from the plant to the work the asphalt is covered with canvas blankets, tied in place.

Texaco asphaltic cement is used exclusively. The ¾-inch stone—the only size used—is furnished by the Tompkins Cove Stone Co. The Crane Sand Co., of Perth Amboy, N. J., furnishes the sand, which must meet the following specifications:

"The sand shall be hard grained, moderately sharp and clean. As delivered, it shall not contain more than 5% of screenings retained on a ten-mesh per linear inch sieve. The aggregate passing the ten-mesh sieve shall be graduated sand and shall have a mesh composition as follows:

Passing 200 mesh sieve	not more than 5%
Passing 80 mesh sieve	not less than 15%
Passing 40 mesh sieve and retained on 80 mesh sieve	45% to 75%
Passing 10 mesh and retained on 40 mesh sieve	10% to 40%

The sand shall not contain more than 3% of clay determined by elutriation."

In order that there may be no delay in having asphalt ready to lay at 8 o'clock in the morning, when the laying gang begins work, the asphalt plant is started at 7 o'clock. By this means the asphalt is on the job ready to lay at 8. Likewise the men who make the cuts report at 7 and thus have a start of one hour over the rest of the gang.

The yardage and mileage of paved streets in the borough at the end of 1914 was:

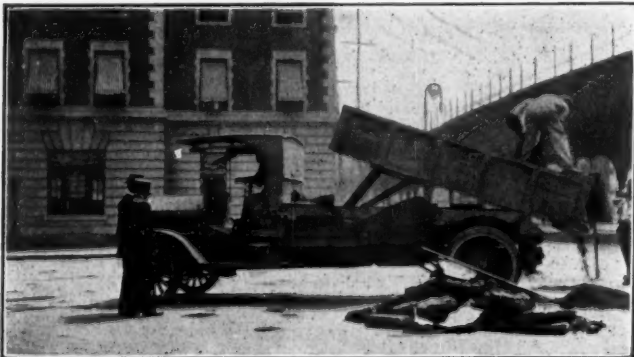
Kind	Sq. Yds.	Miles
3-inch asphalt blocks	1,289,269	57.89
Sheet asphalt	1,201,778	52.98
Granite blocks on sand	660,934	27.33
Bituminous concrete	340,265	17.00
Redressed granite blocks	243,218	9.35
Modern granite blocks on concrete	138,275	5.05
Granite blocks on concrete (old method)	123,230	5.10
Wood blocks	121,791	4.38
Iron slag blocks	31,807	1.55
2-inch asphalt blocks	24,423	1.47
Medina blocks	3,954	0.28
Trap blocks	2,374	0.08
Brick	1,091	0.04
Macadam	123.01
	4,182,509	305.51

During 1914 the following pavements were laid:

Bituminous concrete	122,969	5.15
Sheet asphalt	71,628	3.25
Redressed granite blocks	34,755	1.55
Modern granite blocks on concrete	27,818	0.84
Granite blocks on sand	23,913	0.78
3-inch asphalt blocks	1,128	0.07

Of the 52.98 miles of sheet asphalt, about 50 miles are out of guarantee. Two gangs, each averaging 17 men, are employed in repair and maintenance work. One of these cares for and works over the territory below 161st Street; the other works above this line. Most of the work at the present time is patching, the patches averaging about 3 or 4 square yards each. This, of course, restricts the amount of work done per day.

As yet the plant has not been running long enough to give any reliable cost data, but the department expects to reduce the cost of asphalt repairs and in time to do some of the paving for the borough.



TRUCK DUMPING MIXTURE FOR A PATCH.

OUTSIDE GAS SHUTOFFS.

The desirability of a law compelling the installation of either automatic or manual-controlled outside gas shutoffs in Massachusetts was debated before the Gas Commission at Boston recently. Representatives of the Boston Fire Department were very strenuous for their being placed on every house service, as well as on services entering all business and manufacturing buildings. The gas companies' attorney opposed any mandatory measure as involving large expenditure with small compensating value.

W. E. Addicks, of the Consolidated Gas Co., New York, and chairman of a committee of the Gas Institute to consider the subject of shutoffs, said the automatic shutoff is open to grave objection in that it operates sometimes prematurely and sometimes too tardily to be of service. The simple manual cock, located at the curbstone and controlled by a wrench was regarded as the most practical device. The cost of the curb cocks installed in New York was between \$13 and \$15 where applied to a 3-in. service or smaller. This included the labor cost as well as the valve, cast iron box and cover.

Managers of the Westfield and Holyoke gas lighting departments opposed the proposition on the ground of large expense, which would be levied on the people. It was estimated that to equip all services in those two cities would cost \$50,000 and \$120,000 respectively. About \$3,000,000 would be the cost of installing outside cutoffs on all services in the state, one speaker said.

The practice of curb cutoffs is prevalent in New York, Philadelphia, Dayton, Kansas City and Chicago, the last named recently making it compulsory. In that city a recessed wall device is advocated, but it was the consensus of opinion that a simple flush sidewalk box from which a cock rather than a valve could be operated with a long-handled wrench, would be preferable.

FIRES IN BRICK AND FRAME HOUSES

Relative Frequency of Fires in Each Kind of Building in Seventy-Seven Cities—Less Frequent in Frame Buildings.

The accompanying table, prepared from figures given out by the National Board of Fire Underwriters, gives the number of brick and frame houses and the number and relative frequency of fires in each type of structure in 77 cities in 1914. It will be noted that in most of the cities there was a greater number of fires in brick or stone houses than in frame structures, consideration being given to the relative number of each type of structure.

This occurrence may be partially explained by the fact that as a rule frame structures infrequently house more than one or two families or (in the business district) firms. On the other hand, especially in the tenement section, one house may shelter a dozen or more families, and buildings of such size, being within the fire limits, are usually built of brick. Also a brick structure, if built with a wood interior, is not much more fire resistant than a frame house.

Another basis of comparison would be by means of people housed in the two types of structures or in their relative values. But such figures are not available, nor are those showing the relative loss due to fires in each type of building.

The exceptions to this higher ratio of fires in brick and stone than in frame buildings are Mobile, Ala.; New London, Conn.; Northampton and Somerville, Mass.; Meridian and Vicksburg, Miss.; Sandusky, O.; Allentown, Altoona, Norristown, Philadelphia, Reading and

York, Pa.; Newport, R. I.; Columbia, S. C.; Burlington, Vt., and Charleston, W. Va.—22 per cent of the whole, a sufficient number to show that the condition is not universal.

If we average all the city ratios, we find one fire in each 49.3 brick or stone buildings, and one in each 63.3 frame buildings. If we total all buildings and fires and obtain the ratios from these, we find one fire to each 56.3 brick or stone buildings and one to each 51.9 frame ones. Philadelphia, however, unduly influences this calculation, since it contains more brick and stone buildings than all the other cities combined. Omitting that city, the ratios become one fire for each 30.5 brick or stone and one for each 51.9 frame buildings; or a ratio nearly 70 per cent higher for brick or stone than for frame buildings.

City	Brick or Stone Bldgs.			Frame Buildings		
	Number	No. of Fires	No. of Bldgs. per fire	Number	No. of Fires	No. of Bldgs. per fire
Alabama:						
Mobile	4,025	14	287	8,540	364	24
California:						
Berkeley	420	11	38	11,375	175	65
San Diego	351	34	10	8,341	158	53
San Francisco ..	4,380	297	15	54,492	1,122	49
Connecticut:						
Hartford	7,446	321	23	11,980	148	81
New London....	350	9	39	3,360	94	36
Norwich	795	42	19	4,575	131	35
Stamford	625	26	24	4,050	102	40
Waterbury	1,750	59	30	8,280	151	55
Florida:						
Key West	100	1	100	6,000	21	286
Illinois:						
Bloomington ...	851	37	23	6,213	131	47
Elgin	991	12	83	8,734	48	182
Iowa:						
Cedar Rapids ...	1,189	55	22	8,019	188	43
Dubuque	4,379	95	46	9,983	91	110
Kansas:						
Atchison	731	29	25	4,125	57	72
Topeka	3,281	46	71	16,852	142	119
Maine:						
Portland	1,681	150	11	6,948	305	23
Massachusetts:						
Boston	29,159	1,700	17	72,936	1,511	48
Brockton	196	46	4	12,251	370	33
Cambridge	1,038	75	14	14,878	406	37
Everett	104	17	6	5,860	137	43
Fall River	948	46	21	16,231	320	61
Gloucester	132	3	44	5,842	100	58
Haverhill	441	50	8	8,143	134	61
Holyoke	2,171	185	12	3,886	101	39
Lawrence	275	25	11	8,000	385	21
Lowell	1,260	88	14	18,571	423	44
Lynn	625	309	2	18,235	630	28
Medford	152	3	51	6,684	120	56
Northampton ..	475	12	40	3,545	95	37
Pittsfield	691	41	17	5,571	89	63
Quincy	100	7	14	8,500	148	57
Somerville	644	12	54	14,330	388	37
Waltham	175	15	12	4,200	107	40
Michigan:						
Battle Creek ...	840	59	14	9,366	119	79
Bay City	741	35	21	18,967	278	68
Grand Rapids ..	3,355	61	55	38,807	234	168
Muskegon	425	22	19	5,390	112	48
Port Huron	498	18	28	5,258	110	48
Mississippi:						
Meridian	946	29	33	11,690	451	26
Vicksburg	1,500	7	214	2,800	55	51
Missouri:						
Kansas City ...	18,652	1,036	18	46,318	1,280	36
St. Joseph	7,676	124	62	18,081	291	62
Nebraska:						
So. Omaha	305	38	8	7,840	132	59
New Jersey:						
Bayonne	1,879	53	35	8,287	186	45
Hoboken	3,623	140	26	3,012	86	35
Newark	19,077	410	47	52,117	657	80
Plainfield	662	30	22	4,728	74	64
New York:						
Auburn	1,073	33	33	8,987	66	136
Cohoes	1,104	22	50	4,732	52	91
Jamestown	520	35	15	7,289	84	87
Mt. Vernon	1,038	36	29	6,688	76	88

City	Brick or Stone Bldgs.			Frame Buildings		
	Number	No. of Fires	No. of Bldgs. per fire	Number	No. of Fires	No. of Bldgs. per fire
North Carolina:						
Charlotte	749	54	14	9,263	166	56
Ohio:						
Findlay	415	5	83	3,885	36	108
Sandusky	1,704	15	114	4,467	47	95
Oklahoma:						
Muskogee	408	15	27	4,687	61	77
Pennsylvania:						
Allentown	12,764	58	220	4,057	39	104
Altoona	1,969	62	32	10,197	368	28
Norristown	6,957	52	134	440	17	26
Philadelphia	373,806	3,036	123	11,162	211	53
Reading	23,448	119	197	2,284	26	88
Shenandoah	190	4	47	5,050	65	78
Wilkes-Barre	2,941	46	64	13,417	124	108
York	8,155	42	194	5,055	36	140
Rhode Island:						
Newport	281	4	70	5,669	148	35
South Carolina:						
Columbia	957	22	43	6,552	168	39
Texas:						
Dallas	7,615	118	64	31,230	428	73
Galveston	734	26	28	10,656	267	40
Houston	1,036	96	11	21,840	645	34
Utah:						
Ogden	3,140	41	77	7,433	73	102
Salt Lake City	14,415	211	68	10,985	128	86
Vermont:						
Burlington	1,565	19	82	4,150	173	24
Virginia:						
Lynchburg	1,300	39	33	6,700	91	74
Newport News	884	22	40	3,882	55	70
West Virginia:						
Charleston	1,674	39	43	4,879	133	37
Wisconsin:						
Milwaukee	9,175	644	14	67,102	1,198	56
Oshkosh	889	25	36	9,503	91	104
Totals	613,016	10,881	..	934,932	18,029	..
Averages of city ratios			49.3			63.3
Number of buildings per fire, 77 cities combined			56.3			51.9
Same, omitting Philadelphia			30.5			51.9

STREET CLEANING IN GRAND RAPIDS.

A system of handling street cleanings has been tried out in Grand Rapids, Mich., by Highway Commissioner William M. Walsh, which has proved very successful. Each sweeper is supplied with a two-wheeled truck which carries a galvanized iron can having a capacity of 400 pounds. The handle of the truck is swayed to a semi-circular heavy iron band which is connected with the half-axles at their hub. Connected to the inner ends of the axles and revolving on them is another semi-circular band iron terminating in a hook at each end, which fit under projecting iron nubs on the cans. By this contrivance the sweeper may drop a filled can and pick up another instantly.

A number of sweepers work away from one loading station, where the empty cans are obtained and where they are deposited when full and are covered with gal-



EMPTYING STREET SWEEPER'S BUCKET BY MEANS OF CRANE, GRAND RAPIDS.

vanized tops. From here the sweepings are removed by wagons, which visit each station at stated intervals each day. The wagons are provided with a crane which has been patented by Mr. Walsh. The driver draws up the wagon alongside a row of full cans, lowers a grab-hook which fits over the iron nubs on the cans and by means of a crank at the left side of the wagon winds up a cable which lifts the can. When the can has reached the proper height an iron catch is made fast to the bottom of it and, by a simple shift of gears, it is turned completely over by continued turning of the handle. Thus the lifting and dumping are done by one man without danger of physical injury. The cart, which holds the contents of ten cans, is a regular dump cart.

Before the system was inaugurated, the cans were emptied onto a pile of refuse which was loaded into the wagons by shovels, and was an unsanitary nuisance. This system avoids this and also increases the efficiency of the sweepers, for each man is supposed to contribute a certain number of cans at his station every day, the number being reported to the commissioner by the driver each night, whereas when the refuse was dumped onto a pile this check was impossible. The record also serves as a check on the driver. The cleaning is done with half as many employees under the new as under the old plan.

REBUILDING SALEM, MASS.

Water Works Reconstruction, Street Widening and Other Improvements Made in District Destroyed by the Disastrous Fire of Last Year

By W. B. CONANT.

On June 25, 1914, a large portion of Salem, Mass., was swept away by fire, with a property loss approximating 15 millions of dollars. The rebuilding of the city has proceeded with remarkable promptness, particularly if the prevailing business depression is considered. During the first 12 months 517 building permits were issued for construction in the burned district, with aggregate value of about \$5,000,000. In addition, more than a million dollars' worth of building has been added outside that area. The taxable value of buildings destroyed was \$5,300,000; hence the city has already recouped itself for assessable real estate.

Taking advantage of the wholesale destruction of property, the city is widening or extending several important streets, and is about to build a street extension across a tidal estuary which is to be filled. The upper end of South river, known as Fairfield Dock, in the business section, was acquired by the city for \$75,000, after long litigation. This water basin has an area of about 35,000 sq. ft. and will be filled to a level of 14 ft. above the bed of the stream by city labor, the material being mostly debris. Congress street will cross this area, with a concrete culvert under a portion of it to provide for drainage.

Two fire houses were destroyed in the conflagration. Already one new 3-door house of brick construction is nearing completion, on Boston street, near Essex street; and on the north side of Congress street, on a portion of the filled area, will be erected a new 3-door central fire station for motor apparatus only. The plans have been drawn and the contract is soon to be awarded. The Public Property Department, of which W. L. Gifford is head, has charge of city buildings.

WATER WORKS IMPROVEMENT.

Perhaps the most noteworthy civic improvement is in the water supply system. The lack of adequate supply, with the weakness of existing cement-lined pipes which

prevented high pressure from the town of Peabody being applied, was largely responsible for the widespread progress of the fire. A pressure of 45 to 50 lbs. was then normally available, but with the new system a pressure of 85 lbs. will be provided.

At the time of the fire, 23 miles of cement pipe, laid in Civil War times, was in service. This is being replaced by cast iron pipe of larger sizes. Thus far, about 17 miles have been laid, including a 16-in. main to Salem Willows. The whole renewal will probably be completed by the end of the year. For 4-in. cement pipe, 6-in. iron pipe is being substituted; and for 6-in., 8-in., 10-in. and 12-in. sizes from 8-in. to 20-in. are being laid. The Lowry flush hydrants are being replaced by post hydrants, thus far about 200 having been set.

The city has under construction a 10,000,000-gallon reservoir on the top of Folly Hill, 212 ft. above sea level, which will cost about \$100,000. The city is doing the excavation with 100 men, 20 double teams and 4 plow teams of 4 horses each. The construction of cement bottom, sides and cover is under contract to A. G. Tomasello of Boston for \$67,455. A new 36-in. cast iron main will be laid to Salem, 21,000 ft., and an existing 30-in. main, which passes along the foot of the hill, will be tapped. This will provide a supply to the reservoir from Wenham lake and an auxiliary line from the reservoir to the city. Two new pumps, each of 10,000,000 gallons daily capacity will be installed in the existing pumping station at Wenham lake.

To replenish Wenham lake during the months of December to May, inclusive, the Ipswich river will be drawn upon. At that season the river has a surplus flow which will be diverted into the lake. For this purpose an open canal is being excavated 2 miles to a small pumping station. The canal is 20 ft. wide at bottom, with $1\frac{1}{2}$ to 1 slope on the sides, and is designed for a 10-ft. depth of water. There will be a concrete forebay 15 ft. square and 16 ft. deep, with 8 ft. intake.

The station will be electrically operated by a 150-horsepower motor driving pump with a capacity of 25,000,000 gallons a day. Electricity will be obtained from the Beverly Gas & Electric Co., Beverly, Mass.

From the pump discharge, with Venturi meter connected, a 48-in. steel pipe has already been laid 120 ft., there connecting with a 48-in. concrete pipe of Lock Joint Pipe Co. manufacture, which runs 1,500 ft. Thence 350 ft. of 36-in. cast iron pipe continues through a swamp, the joints resting on reinforced concrete cradles erected on double piles. At the farther side of the swamp the iron pipe discharges into 36-in. concrete Lock Joint pipe which continues 700 ft. to the discharge at the margin of the lake.

The reinforced concrete pipe was cast on the ground in 4-ft. sections, local sand and gravel stones to 1-in. diameter entering into a 1:2:4 mix. The plant had a capacity of 120 ft. a day, 15 to 20 steel molds being used at a time. Each section of the pipe was wedged to true line and grade and the joints filled with thin 1:2 grout.

The Ipswich river-Wenham lake construction is for the benefit of both Salem and Beverly and is in charge of P. J. Kelley, Director of Public Works of the former city. Fred T. Ley & Co., Springfield, Mass., is the general contractor, the laying of the pipe being sublet to A. G. Tomasello.

STREETS AND BUILDINGS.

The improved conditions in the residence parts of Salem are already forecast by the houses and streets thus far reconstructed. The new buildings are in advance of former ones, both architecturally and in the character of materials. Wood shingle roofs are forbidden by the rebuilding code; tile, slate and asbestos coverings predomi-



RECONSTRUCTED SIDEWALKS ON FAIRFIELD STREET,
New Tree Space Provided.

nate in the residential section, and tar and gravel in the business district. Other safeguards are the requirement of chimney flue linings, plastering over and around furnaces in cellars, metal cornices, etc. "Three-deckers" are not allowed, with the result that large brick and concrete apartment houses and four-family wooden and stucco houses have been built. One-family houses completed or in process number 171; two-family houses, 287; four-family houses, 62. In all, 850 compartments have been completed, with 550 more under construction. All new structures are required to set 5 ft. from property lines, except for blank walls of blocks.

New granolithic sidewalks have been laid in various localities, constructed of cinder base, crushed stone concrete filler and 1:1 surface finish. The city pays the entire cost of the walks, no betterment assessment being levied on abutters.

On Fairfield street, in the residence section, the former sidewalk lines have been retained and a 5-ft. tree space provided between a 5-ft. sidewalk pavement and the street curb, on either side. The same plan prevails on Daw street, where the tree space is $3\frac{1}{2}$ ft. wide. In the fire 594 shade trees were destroyed and had to be removed. During the year 228 new trees have been set, mostly of fair size, half of them on the main thoroughfare through the residence section.

Results of the fire showed that of the three predominant types of street paving, bitulithic stood the heat best; the macadam resisted fairly well, while the granite block pavement chipped badly and in many cases proved a total loss. In some localities, however, the blocks may be utilized by inverting them in relaying. About 22,500 linear feet of roadway were affected.

Curbstones in the closely built sections were a total loss, being badly broken by the action of the intense heat and even more badly shattered where subjected to the action of water.

Damages paid for street widenings have been based on the assessed value of the land, with no reference to the income derived from the property. In general, all takings have been on one side of the street only.

DENVER STREET CLEANING.

The paved streets of Denver have a length of 46.96 miles, covering an area of 1,076,264 square yards. The street cleaning division in 1914 cleaned once 195,215,580 square yards from which 28,221 cubic yards of sweepings were removed and hauled to the dumps at a cost of \$0.167 per 1,000 square yards. The alley cleaning gang cleaned 13,794,242 yards at an average cost of \$0.38 per block or \$0.45 per 1,000 square yards. The "white wings" swept 94,472,375 yards, gathering 3,671 cubic yards of dirt, the cost being \$0.167 per thousand square yards.

Streets and sidewalks are flushed regularly. During 1914, 2,339 city blocks of sidewalks were washed at \$0.24 per block and 77,300,900 square yards of pavements were flushed, the cost being \$0.14 per thousand yards.

Other duties of the department included weed cutting, 2,437 vacant lots being cut at a cost of \$1.50 per lot, and cleaning of unpaved alleys and of the city market. From the latter, 1,092 cubic yards of refuse were hauled to the dump at a cost of \$0.855 per yard. From the dirt alleys, 13,575 yards of refuse were removed, the cost of this work being \$0.525 per cubic yard. In the winter months the department removes snow and ice and last year 66,623 cubic yards of snow were removed, the cost being \$0.2516 per cubic yard. This cost includes removal of ice from all streets.

The total cleanings hauled to the dumps by the department included 63,625 cubic yards of street cleanings, 321 tons of trash and 66,623 cubic yards of snow.

CLARIFYING SEWAGE BY FINE SCREENS

Comparison of Screens—Fine Screening vs. Sedimentation—Effectiveness of Fine Screens—Handling Screenings.

(Continued from page 188.)

COMPARISON OF SCREENS.

The author compares the various screens as to efficiency, adequacy and reliability, nuisances, accessibility, first cost, and cost of operation. Other things being equal, the finer the screen the higher the efficiency in removing solids; but other factors may more than balance this. One of these is the amount of material which may escape around the edges of the screen. The efficiency also depends on whether the screening surface consists of bars, perforated plates or a wire mesh; whether the solid particles are broken up by abrasion due to too high velocities or are macerated so as to be carried through the screen by the current, or whether they are pressed through in the process of cleaning. Velocities through the screen should be moderate, and for this reason it is better that the motion of the screen should not be against the current, and that it should be adjustable.

Round bars are probably undesirable, as they allow floating solids to enter and become wedged in the openings. Bars of a thin rectangular section are preferable as offering less resistance to flow and having greater strength than other forms of the same quantity metal. Experiments made on wooden strips 3 inches by $\frac{1}{2}$ inch in section at Cornell University indicate a co-efficient of discharge of .811 if the sides are left parallel, increasing to .832 if sharpened on the down stream edge and become 1.032 if sharpened on both edges. But the great advantage of sharpening on the upper edge cannot be availed of for the same reason that round bars are objectionable.

Perforated plates, as in the Riensch-Wurl screens, have an advantage in intercepting straws, matches, hair and fiber which might pass between bars or even slots with equal spacing.

The American wire mesh screens of Weand and Jennings are the finest of all. Objection has been found to mesh screens in that they promote the disintegration of the solids so that an appreciable quantity passes through with the liquids. This has been observed in connection with the Riensch-Wurl screen and also the shovel vane screen.

A very important feature in any screening device is the method of cleaning, as the thoroughness of this operation directly affects not only the efficiency but also the

cleanliness of the plant and the reliability of operation. For cleaning perforated drum screens, compressed air is considered by Metzger as most efficient, inoffensive, and as giving drier screenings than when they are removed by jets of water.

Sufficient precise and reliable experiments concerning the thoroughness of screening by different devices apparently had not been made. Many of those which had been reported are more or less inconsistent. In general, the data collected show that from $\frac{1}{2}$ to $1\frac{1}{2}$ cubic yards or more of screenings may be removed from one million gallons of ordinary domestic sewage at a cost of from \$1 to \$2. Care in operation has much to do with the station efficiency of a screen, a case having been brought to the author's attention where change of administration was apparently the cause of a decrease of 16 per cent in the annual efficiency.

The influence of pumping and of length of travel in comminuting the solids and increasing the colloidal matter should be kept in mind as factors which may cause a marked lowering of efficiency.

The range of sewage level should be considered, or regulated by the size of the stream. In the case of the band screen, the surface may rise nearly to the belt conveyor, which is usually just below the top; with the wing, shovel-vane and drum screens it may rise to a point just below the axle; and with the Riensch-Wurl screen, to the highest point reached by the base of the cone during a revolution. Larger proportions of hand and of Riensch-Wurl screens are submerged during periods of maximum flow and less head room is required. As the range of level of the latter is limited by the diameter and inclination, however, this type is not well suited to small volumes of flow combined with wide variations in level, under which conditions the band screen offers advantages, as it may be made of any length.

Operation should be practically automatic and is nearly so in all these screens except where speeds are to be varied to prevent clogging. The fine deposit of grease that usually occurs on any screen will require special removal at times and, with fine perforations or meshes, a mat of fine fiber or hair may gradually form over the surface; otherwise the cleaning devices appear to be effective.

If properly operated and kept clean, there need be no objectionable odors or other offensive conditions in the neighborhood of these screens. With septic sewage there is, of course, more danger of foul odors than with fresh. Any spattering or spraying of the sewage caused by high speed or improper design, especially in the application of air, steam or water jets for cleaning, increases the odor. Another and more probable cause for offense lies in the disposal of the screenings. From observation of a good many plants the writer is convinced that screenings should either be incinerated, artificially dried or promptly removed from the works. During stormy weather, this should not be delayed more than 24 hours from the time of collection. Offensive conditions may be mitigated by composting the screenings.

All parts of screens should be accessible for cleaning, repair and removal with the least interruption of operation.

The cost of a screening plant depends not only on the screen and its auxiliary machinery, but to a great extent on the location, foundations and size of chamber. Mr. Wurl told the author that the cost of Riensch-Wurl screens in Germany varied from \$720 for a 4-foot 3-inch screen (equaling \$775 per million gallons per day), to \$12,000 for a 26-foot 4-inch screen (equivalent to \$48.40 per million gallons per day). A plant of this kind installed and ready for operation, however, costs many times this amount in this country.

Depreciation, repairs and renewals may be an important item. The materials used should be durable and subject to the least possible corrosion. The Riensch-Wurl and shovel-vane screens involve the periodic renewal of brushes. The Hamburg screen is subject to wear on many moving parts. The Weand screen has shown indications of depreciation from corrosion and wear. Experience with all of these screens has been too brief to assign a probable period of life, and one can only form an opinion in each case from the design and the conditions under which it is to be operated.

FINE SCREENING VS. SEDIMENTATION.

Experience seems to show that from 30 to 50 per cent of the suspended solids may be removed by fine screens, as compared with 50 to 65 per cent by sedimentation. Tank treatment uses little head and is subject to little deterioration such as is inevitable with machinery of any kind. Cost of attendance for tanks may be a little greater, but such attendance, except for general supervision, may be of a somewhat lower grade than is necessary when motors, screens, conveyors and possibly boilers, engines or air compressors have to be looked after. Monti, after the Berlin experiments, concluded that, although fine screening removes all the offensive looking matter, the liquid remains quite turbid, and much better results can be obtained by a few hours sedimentation in large tanks. George M. Wisner concluded from experiments in Chicago that there is little or no improvement in the stability of the local sewage due to screening through a device with 40 meshes to the inch.

On the other hand, tank treatment requires considerable area which is sometimes difficult to secure at moderate cost. With plain sedimentation a large volume of watery sludge, which becomes very offensive if stored, must be disposed of, and this means an additional area for drying, with perhaps additional cost for artificial drying or transportation to sea. Imhoff tanks require less land than other forms but are more costly to construct.

George W. Fuller, in a report to the Metropolitan Sewerage Commission of New York, said:

Fine screens afford the cheapest way of removing visible objects of sewage origin from the waters receiving sewage where such screening treatment alone is sufficient for obtaining satisfactory results. Under conditions where the limit is at times reached in the amount of clarified sewage which a watercourse will oxidize satisfactorily, settling tanks as a general rule are cheaper to install than screens, because for a given cost they will remove a greater quantity of organic matter.

* * * * *

In my opinion, screens are preferable to settling tanks only where it is desirable or necessary to remove only relatively large sewage matters in suspension. Where settling solids would form deposits in the watercourses if screening alone were adopted, to install settling tanks will prove wiser than to install fine screens.

Screening plants, however, are very compact and, with grit chambers, need never occupy more than a fraction of a city block. The process is cleanly and largely automatic, requiring very little attendance. The product is much more readily handled and contains less moisture than sludge—generally 75 to 80 per cent instead of 90 per cent.

If recovery of grease or fertilizing value is considered, dried screenings will be found, as a rule, to contain much more organic matter than the dried sludge, and therefore bound to yield a greater return.

The author is of the opinion that fine screening will be adopted in the future by many towns situated on bodies of water which are capable of assimilating the effluent; possibly also as a preliminary process to tank treatment, filtration and disinfection. On the other hand, relatively high cost of attendance and the probable

lack of market for the screenings, as compared with conditions abroad, will probably serve to prevent the marked increase in their use in the United States which has been experienced in Germany.

The adoption of screens should be considered (1) where the principal requirement is removal of the larger solid matters, (2) where land values are high, (3) where cost for excavation for tanks is high, (4) where the cost of sludge disposal is high or where it is likely to cause objectionable odors, (5) where the recovery of grease and fertilizer is an important factor.

DISCUSSION.

Effectiveness of Fine Screens.—In discussing this paper Rudolph Hernig criticized the title, stating that screens did not clarify sewage at all, even the finest screens removing none of the turbidity.

Mr. Hering has pulled out from under sprinkler nozzles, spreading sewage which had been finely screened, lumps of matter—mycelium and other fungous growths—almost as large as one's fist. Screens do not prevent clogging from such causes, nor will they stop grease from accumulating on the beds. He suggested the use of fine screens for removing suspended matter *before* the sewage reaches an outfall. If you take sewage as it leaves the house or soon after and filter out all the suspended matter it very rarely becomes foul on standing, there being at that time very little organic matter in solution. He believes that as our population increases there will be increased trouble in treating sewage to obtain higher standards, and it may then be necessary to remove the suspended matter as near its origin as practicable because it cannot be treated as economically in its liquid as in its solid form. (In this connection J. H. Granbery stated that in Paris certain portions of the sewers have rectangular channels provided for the use of belt screens, which are inserted in certain parts of the sewer system.)

While not enthusiastic about fine screening for domestic sewage, Mr. Pearse believes that the application of screening to industrial wastes of a coarse nature a great advantage.

L. C. Whittemore believes that material reduction in the rate of sludge accumulation in settling tanks would result from previous fine screening and the saving in sludge storage capacity and area required for drying beds is obvious, and would permit a considerable saving in cost of tanks and beds. Experiments made in 1914 on a Dortmund tank showed that with screened sewage there was a scum accumulation at the rate of $\frac{1}{2}$ cubic yard per million gallons, while with unscreened sewage the rate was 3.1 cubic yards per million gallons.

Data which Samuel A. Greely had collected indicated that a removal of 15 per cent of the suspended matter is seldom reached in practice and that 30 per cent is impracticable.

Emil Kuichling prepared a written discussion of this paper, the last work done by him before his death. Referring to the amount of matter removed by screens, he stated that the figures given by Mr. Allen probably referred to wet screenings, one cubic yard of which represented about 375 pounds of dry substance. On this basis, Mr. Allen's figures would give about 712.5 pounds of dry matter removed per million gallons of sewage, or 85.43 parts by weight per million, or 34.88 pounds per thousand persons daily. "These quantities are certainly large enough to make a marked improvement in the quality of the sewage and to reduce materially the volume of troublesome sludge produced by subsequent sedimentation. It may also be inferred that the sludge deposited after the sewage has passed through a fine screen will be much more easily and extensively decomposed by bacterial action than sludge of unscreened sewage."

George T. Hammond believes that the fine screen is indicated for extensive use in great seaboard cities and in cities on large bodies of water, in which screening will prove sufficient for local conditions and will give complete satisfaction. It will also be useful where sewage farming in any of its forms is adopted, and in connection with sewage disposal plants for the purpose of removing scum-forming materials from the sewage previous to tankage, and also for protecting sprinkling filter nozzles from clogging.

William L. D'Olier suggested the use of fine screening for storm water which is now discharged without treatment.

John H. Gregory believed that the use of fine screens in connection with settling tanks to prevent the formation of scum might be very advantageous, but it seemed to him that the data were yet too meager to permit definite conclusions on this point to be drawn.

Handling Screenings.—Emil Kuichling stated that the chief difficulty in screening sewage is in preventing serious obstruction of the orifices and in cleaning the apparatus in an unobjectionable manner. The removal of the screenings has hitherto been accomplished by combs, scrapers, brushes, or by jets of water, steam or compressed air; but in all such operations some spattering takes place whereby finely divided sewage matter gets into the surrounding air which must be breathed by the attendants and may thus cause sickness. This danger can be obviated by applying a suction apparatus to the wet screenings and removing them in a pipe to a receptacle. Such a device, however, has not yet been developed.

John H. Gregory considered the matter of handling and removal of the screenings of the greatest importance, since these rapidly become offensive. The handling and removal of screenings from a plant is just as important as of sludge from settling tanks, and provision must be made for doing this promptly if offensive conditions are to be prevented. From his observations he believes the surest way to prevent nuisance from screenings is to keep them from the atmosphere, and the simplest way to do this would appear to be to keep them in the sewage and handle them in the settling tanks.

Concerning the offensiveness of screenings, Samuel A. Greely stated that at plants visited by him the screenings were very unsightly and unpleasant to handle, quickly fouling cars, conveyors and chutes and causing offensive odors. When placed on land they became very foul. Disposal of them by incineration added considerably to the cost.

Several of those discussing the paper called attention to the importance of the amount of head lost in passing through the screen, concerning which there seemed to be very little information.

Langdon Pearce questioned why Mr. Allen selected 0.6 of an inch as the line of demarkation between coarse and fine screens; stating that he would certainly draw the line at or below 0.1 of an inch.

PRODUCTION OF PETROLEUM.

Petroleum has come to be among the most important natural resources of this country. Although the yield in some of the earlier fields has fallen off, the output is increasing. In 1913 this country marketed 248,446,230 barrels (of 42 gallons), and in 1914, 265,762,535 barrels, an increase of about 7 per cent. In the former year this country produced 64.59 per cent of the world's consumption and in 1914, 66.36 per cent. The next largest producer was Russia, with 16.34 and 16.74 per cent, re-

spectively for the two years, or about one-fourth as much as the United States. Mexico was the only other country which produced more than 5 per cent of the world's total.

WATER METERS IN LA GRANGE.

By G. H. SARGENT.*

There is probably no subject in the water works business that has been more widely discussed than the question of water rates and the method of applying, i. e., flat rates or meters.

There are arguments in favor of flat rates and arguments in favor of meters, but I doubt if there is a water works man anywhere who regrets the adoption of meters where flat rates have been in effect. To reduce the cost of operating and increase the revenues, the leaks must be reduced or eliminated and the installation of meters is the only practical means of accomplishing it.

Politics often plays a part in this matter, and the superintendent has his hands tied. He wants to make an economical showing of his year's business. His cost of operating is high, and his revenues low compared to the number of consumers and the amount of pumpage, but if he is a practical man, allow him to install meters on every connection, even on the municipal accounts, establish reasonable rates consistent with plant investment and expense and then watch the results. I am told of a Southern city where a city manager endeavored to install meters on all accounts and was making headway; but politics did not want this kind of a business man and he was asked to resign.

For the year ending April 30, 1915, my first year in connection with the municipal water works of La Grange, Ga., the results obtained by free-hand management were gratifying and I trust that some reader will benefit from the figures which I will give and which endorse 100 per cent meters.

In June, 1914, the city purchased the water works from a corporation with ownership in Philadelphia. A careful survey showed that the pumpage was too high for the number of consumers, that waste was excessive and a remedy for this defect was our first aim; and the first thing done after taking the property over was to install meters on every connection where flat rates had previously been in effect.

Only 60 per cent of our connections had been metered, but in sixty days the other 40 per cent were added, with telling effect both in the pumping and in the consumption. During the first month after the meters had been installed our pumpage was reduced 25 per cent under any month during the previous three years. We saved a million gallons a month in our flush tanks alone, due to installing jet meters to replace open bibbs. During this period there were added 145 new consumers, including two manufacturing plants, and it was noticed that as the legitimate consumption was increased the leakage and waste decreased; our pumpage still continued to fall off, but our revenues were increasing so that at the end of the fiscal year, April 30, 1915, we had added 25 per cent more consumers, reduced the pumpage 27 per cent and increased the revenues 12½ per cent. Out of our revenues were paid all operating expense, interest on \$150,000 bonds, one year's depreciation on the plant and the balance showed a net gain of \$1,800.

The success of our plant I attribute entirely to the absence of petty politics and the installing of 100 per cent meters.

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CHANGE OF ADDRESS

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Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for. Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

AUGUST 12, 1915.

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Commission Managers.

In the two and a half years since the first city manager, in Sumter, S. C., began his demonstration of the advantages of that system of municipal government, twenty-five cities and towns have adopted it and five states have provided for its adoption by any cities desiring to do so. Such rapid spread of a new idea does not necessarily prove or even indicate its success. It rather shows how ready our cities are to try any new plan that promises well, and also probably how dissatisfied they are with the old systems, or at least with the results obtained by them. But will the results of the city manager plan be any more satisfactory when the novelty has worn off and the voters cease to pay any attention to the government except at election time?

The secretary of the National Short Ballot Organization, in an article in the National Municipal Review, gives an apparently unprejudiced review of results to date, and this seems to indicate an affirmative answer; also that, as in the case of all plans of government, a vital feature is the man selected to fill the position. And here is one of the inherent advantages of this plan. For it has been accepted almost without argument that the city manager need not be a resident, thus making possible the professional city manager. Almost never have our cities been in charge of men trained in city government, and to provide for and employ such men for this work would seem to be a decided step in advance.

Fires and Timber Construction.

Some months ago an association interested in promoting the use of lumber quoted figures from the reports of fires in Chicago in support of their claim that there is less probability of fire in a frame house than in one of brick or stone. The idea seemed rather startling to many at first thought, but figures published by the National Board of Fire Underwriters, taken from reports of 77 cities for the year 1914 (see page 217 of this issue) indicate that this condition as to fires is by no means exceptional in the case of Chicago. In San Francisco, frequency of fires in brick or stone buildings is more than three times as great as in frame. (In each case the figure used in comparison is the ratio between total number of buildings of a given kind and fires which occurred in such buildings during the year.) In Hartford, Conn., brick buildings appear to be three or four times as liable to fires as frame ones; in Boston about three times; in Grand Rapids three times; in Kansas City twice; in Newark, N. J., twice. These are amongst the largest cities on the list, but a notable exception is Philadelphia, in which fires occurred two and a half times as often in frame buildings as in brick ones. It may or may not be significant that in each of the cities named except Philadelphia, the number of frame buildings is several times as great as that of brick or stone, while in Philadelphia there are about thirty-four times as many brick buildings as frame ones. In other words, the lower frequency of fires is found in that class of buildings which predominates in each city.

That this relation is not accidental or merely brought about by some one unusual happening, is demonstrated by the fact that it is found in 55 out of 77 cities. One peculiarity is that, of the exceptions to the rule, six are found in Pennsylvania out of eight cities reported, while in Massachusetts there are only two exceptions to the rule out of 17 cities reported.

As a matter of fact, there would seem to be no particular reason why fires should not start as readily in a brick building as in a frame one, providing the interior construction is similar, as is generally the case. Also, if the brick buildings have shingle roofs or roofs of other inflammable material, fires started by sparks flying from conflagrations in the neighborhood would make no distinction between the two kinds of buildings. About the only advantage from the conflagration point of view of brick or stone buildings would be, therefore, in freedom from fire communicated by immediately adjoining buildings through the walls, and to a certain extent (but not very considerably) in confining the fire within a building of masonry construction so far as the adjoining buildings are concerned. The latter would not offer a very considerable advantage unless all windows or other openings were covered with fire-resistant shutters, as is not often the case, especially at the time when fires are most likely to occur. Moreover, even in resisting fires in adjoining buildings, a brick wall is by no means sure protection, since a hot fire may enter through windows and doors.

The conclusion would appear to be that to be of any great value the fireproof construction must extend throughout the building, including floors and partitions and roof as well as exterior walls. Moreover, in most buildings the contents play as important a part as the construction itself, and if these are of wood and other inflammable materials, they are as likely to catch fire in one kind of building as in another. The building therefore should be so constructed as to confine within each room or compartment the fire originating there.

In a number of cases, buildings really fireproof have not been free from fire, in that the contents of such buildings have been ignited by fires in adjoining build-

ings and more or less damage done to the floors and partitions of the fireproof building thereby. Such damage, however, is almost sure to fall very far short of its destruction, and the difference is well worth the additional cost of the fire-resistant construction of the building.

Especially important are such buildings in preventing the spread of a conflagration. Many a fire which was practically beyond the control of the firmen has been stopped by one or two fireproof buildings which, although they themselves suffered somewhat, especially in their contents, acted as a wall against the intense heat which had made it impossible for the firemen to work in the path of the advancing flames.

NIAGARA FALLS WATER FILTER SUIT

Injunction to Prevent City from Discharging Into River the Wash Water from Filtration Plant

The Supreme Court of Niagara County, N. Y., has handed down a decision bearing upon the right of a water company to discharge the washings of its filtration plant into a river, which is of considerable interest and may affect other filtration plants as well, although the conditions are somewhat unusual. As described in our issue of June 12th, 1913, Niagara Falls is provided with water by the city and also by a private water company known as the Western New York Water Company. As described in an article in the June 19th issue, the city maintains a filtration plant and in connection therewith applies aluminum sulphate and hypochlorite to the water. Before filtering, the water is clarified in sedimentation basins. The purpose of all this is, of course, to retain suspended matter and bacteria in the basins and filters, which matter must be disposed of in some way. The method employed is to discharge the wash water used in the filters and the sediment drained and washed from the sedimentation tanks into the Niagara river immediately below the plant.

The water company's plant is about two miles below the city's filtration plant, and the company maintains that the water taken by it from the river is polluted by these washings from the city's filtration plant and that it is injured thereby; this being especially the case because the city takes its supply from a point 2,000 feet out in the river and discharges the matters removed along the bank of the river and the currents in the river are such as to carry this matter to the point where the company's intake is located. Moreover, the city not only returns to the river the impurities which it took from it, but it also adds chemicals which the evidence apparently showed amounted to three tons of hypochlorite per year and 300 tons of aluminum sulphate, or a total average of nearly one ton of chemical matter per day.

Why the company should object to the presence of aluminum sulphate and hypochlorite, or the inert residuals from these, in the water taken by it, assuming any of it reaches its plant, we do not find to be stated; the effect could hardly be injurious and would seem to a certain extent to be beneficial. As this suit was brought in a court of equity, asking for an injunction rather than damages, the amount of injury sustained was not stated, the plaintiff resting his plea upon the claim that, as riparian owner and user of the water under a legal franchise, it was entitled to the right of receiving water at its plant in as unpolluted a condition as that above the filtration plant of the city.

The city maintained in defense that the average effluent from its plant was even purer than the river into which it is discharged—a statement which the court ap-

parently did not consider to be substantiated by proof; that it returned to the river materials which were originally in it and therefore did not pollute the river; that there were many other plants and cities above the company's waterworks which were polluting the stream more seriously than the city was even accused of doing, and that the State Board of Health, in approving the filtration plans, had given it the right to discharge its effluent into the river. As to the last, the court states that the city was unable to show the approval by the State Board of Health of the discharge of the waste effluent into the river and also failed to show a permit from the Secretary of War for such discharge, without which permit it would be unlawful. There were one or two other points of a legal nature, such as a question of the validity of the water company's franchise, its right to obtain an injunction in a court of equity, etc. The court decided that the company was entitled, under its rights as a riparian owner, to the injunction asked for restraining the city from discharging the filter plant effluent into the river and granted the city six months in which to provide another outlet; suggesting that this effluent might be discharged into a sewer which passed near the filtration plant and discharged into the Niagara river below the Falls.

SALT WATER SWIMMING POOL.

A valuable addition to its playground and recreation facilities has recently been provided by the city of Salem, Mass., in the construction of an outdoor salt-water swimming pool in Forest River Park. A basin three-quarters of an acre in area was formed by utilizing an old dock and an adjacent float which was overflowed at high tide. Wood sheeting was driven across the opening from the river a distance of 80 feet, the enclosed basin excavated and levelled with gravel, a masonry wall constructed to exclude the tide, and the banks lined with field stones on which No. 2 gravel was deposited.

At one end of the basin the bank was sanded and a sand bed with 100 cu. yds. of sand provided for children to play in. The depth of the basin is 8 ft. at the site of the dock, the wall of which was allowed to remain, furnishing an excellent place from which to dive. A spring-board was also provided for the girls to dive from. At the upper end of the pool the depth is 3½ feet at its deepest, with well graded bottom, affording firm footing for children.

The water is changed daily by letting out the contents of the basin at low tide through a hand-operated tide gate and allowing the basin to fill when the tide rises.

All the construction work was done by the "unemployed," about 90 per cent of the \$8,500 expended going for labor. Stones for riprapping the banks were taken from the fields of the newly developed park.

A wooden bath house, a man and woman attendant on duty all day, and an extra matron on duty in the afternoon, are provided by the city during the summer months.



SALT WATER SWIMMING POOL, SALEM.

The WEEK'S NEWS

Good Road Days for Kansas—Convict Road Labor in California, Missouri and Maine—Pittsburgh's New Bridge—Wanaque Project Ratified—Water Supply Improvements of Lynn, Fort Worth, Hibbing, Los Angeles and Portland, Ore.—Water Waste in Four Cities—Finances of Saginaw, Mich., and Hartford City, Ind., Waterworks—Columbus Light Plant—Natural Gas Rates in Kansas—Nashville Developments—Financial Troubles in Hibbing, Birmingham and Manila—Duluth Charter Invalid.

ROADS AND PAVEMENTS

Kansas Good Roads Days.

Topeka, Kan.—Kansas will observe Good Roads days August 18 and 19, according to a proclamation issued from the office of Governor Capper. Organization of the workers in each county into a military unit under the command of a road general is urged, and it has been announced that Governor Capper will assume charge of an organization of state-house employees, who, armed with picks, shovels and plows, will attack some of the bad roads in Shawnee County. It is pointed out that because of continued rains, unprecedented damage has been done Kansas roads this year. At the recent state flood congress it was estimated that the loss will run into hundreds of thousands of dollars, the actual road damage in the Kaw Valley amounting to more than \$400,000, according to a report made by W. S. Gearhart, highway engineer of the Kansas State Agricultural College.

Pittsburgh's New \$1,000,000 Bridge.

Pittsburgh, Pa.—Pittsburgh's new million dollar North-side Point Bridge will soon be ready for traffic. This structure is one of the most important civic improvements that has been made in this city for some time. Workmen are busy putting the finishing touches on the electric wiring and the asphalt paving of the bridge. The north approach consists of a series of reinforced concrete spans of varying length, and a long fill between concrete retaining walls. The total length of this approach is about 865 feet. The arches of the spans rest upon concrete pile foundations. The retaining wall has a length of about 442 feet and is 55 feet 6 inches at its widest point. The retaining walls rest upon an old fill which was originally made by general dumping. They are constructed in sections with a vertical expansion joint at each pilaster. Granulated blast-furnace slag has been used to fill behind the concrete retaining walls in order to decrease the lateral pressure. The south approach is somewhat longer than the one on the north. It has a total length of about 913 feet. It has, however, but two arches as compared with six on the north approach. Its breadth is, also, 55 feet 6 inches at the widest point. On account of the varying height of the retaining walls, three types were

used. The gravity type of retaining wall was used up to a height of about fifteen feet. The cantilever type was used on walls having a height of from 15 to 25 feet. For all walls having a height greater than 25 feet the counterfort type of retaining wall was used. Both approaches are provided with a structural iron railing, with cast iron posts placed from 9 to 11 feet apart. The city has placed street car tracks on this bridge at its own expense, and before any use can be made of them the Pittsburgh Railways Company must apply for a franchise. On this account it is believed that cars will not be run over the bridge for some time to come. Extensive plans are being made by the North Side Chamber of Commerce in regard to the opening ceremonies for the bridge. Appropriate exercises will be held when the bridge is altogether completed and ready for public traffic.

Convict Road Work in Three States.

Sacramento, Cal.—The first step in the experiment of working convicts on the state highways under authority of the so-called convict labor bill passed by the recent legislature has been taken by the state highway commission in determining to appropriate \$250,000 for this work out of the \$2,500,000 state highway bonds which will be sold this month. Already requisitions for the men have been forwarded to the state board of prison directors. Convicts in San Quentin now are busy making the khaki working clothes and heavy boots and shoes to be worn by the workers, and camp outfits are being manufactured for the equipment of the several camps to be established as soon after the 8th of next month as possible. These details were announced by State Highway Commissioner Stern, who, with Warden James J. Johnston, will be in direct charge of the convicts during the first stages of the work to be undertaken in Mendocino and Humboldt counties. There will be constructed by convict labor 33 miles of state highways in Medocino county from Cummings to the south fork of Eel river and 15 miles in Humboldt county, from Miranda to Barberville. Three camps, working on unit system of 60 men to each camp will begin in Mendocino county. These camps will consist of a working crew (the road builders), the cooking or camp tending crew and the police-crew. There will be no guards, and no armed forces.



Courtesy, Pittsburgh Industrial Development Commission.
Rear of Retaining Wall.

View of Approach.

NEW \$1,000,000 BRIDGE IN PITTSBURGH.

This system will be under the general supervision of the state highway commission and the state board of prison directors, the first to have complete charge of the labor features, while the prison directors will have charge of the discipline features and the administering of the camp life. Commissioner Stern and Warden Johnston will go into camp with the convicts. They will sleep in the camp tents and eat at the camp mess. They will share the life of the convicts in the mountains, making a study of the state prison labor experiment and with the object of perfecting the system for the benefit alike of the men and the state. Each camp will have a superintendent and foreman in direct charge. The system to be used will be the Colorado modified honor system, giving to the men additional credits and other advantages for their labors. No men will be taken who have a short time only to serve. No man will be taken who the prison authorities believe cannot be trusted. There will be no emptying of the prisons onto the state highways. All the men will come from San Quentin. The first requisitions call for 180 men.

Jefferson City, Mo.—Colonel Frank Buffum, State Highway Commissioner, is very well pleased with the convict road camp which has been in operation for about a month. The work is being done in Osage County, about twenty-five miles east of Jefferson City, widening a road on the edge of a rock bluff. Osage County has a very up-to-date court which co-operated with the highway department. The convicts are given excellent amusements. Guards are employed at the camp until it is proved practical. Governor Major gives three days off the sentence, each month, for good conduct, while after their eight hours work for the county the county pays them for two hours work at the standard wages. The bill of fare includes vegetables, cereals, eggs, fresh meat, milk, butter and sugar—all of good quality and well cooked, an unusual thing in the prison. The success of the road camp is considered most important to Missouri. It has over 2,600 male convicts in the penitentiary with cell room for 1,000, often making it necessary for five and six men to be huddled together in one cell. The prisoners have been worked under the contract system but owing to co-operation between the National Committee on Prisons and Prison Labor and the Penitentiary Investigation Committee of the Missouri Senate this system cannot continue much longer.

Portland, Me.—The convict road work in Cumberland county has been found very successful under Sheriff Pennell and the county commissioners. An average of 40 prisoners are worked from a central camp. The road construction is done under the supervision of the State Highway Department, but the care, custody, discipline and feeding of the prisoners is under the direction of the county officials. The construction work is in Windham and Raymond on the State road to the White Mountains—about 20 miles from the jail at Portland. The camp is in sections so that it can be readily taken down and removed to some other location. The men are given an abundance of good, plain, well-cooked food, the cost of which averages about 45 cents a day per man, while at the state prison at Thomaston the average cost is but 15 cents. Three guards are employed, two during the day and one at night. The day guards really act as crew bosses. The men do as much work as the ordinary laborer. They are dressed like other laborers, and a great deal of liberty is allowed, and the treatment excellent. The convicts are all short time men serving sentences from 30 days to nine months. Every day's labor is worth at least \$1.75 less the cost of food, while in the jail the county received only about nine cents a day when they worked, and had to pay for food.

Bridge Patent Suit.

Des Moines, Ia.—The city of Des Moines is to be made defendant in a suit to be brought by F. H. Drury, attorney for the Thatcher bridge patent interests, charged with infringement on the Thatcher patents in the three Melan arch bridges constructed here. Polk county was made the defendant in a similar suit in the federal court a short time ago. The Polk county board of supervisors

plans to fight its case through to the finish, although attorney Drury has intimated that if they saw fit to make an offer for settlement he would be glad to consider it. The county officials do not recognize the validity of the patents in question and even so they declare that no such patents have been infringed upon because the type of construction used in their bridges is not the Thatcher type. Henry E. Sampson of the attorney general's office has consulted with the state highway engineers on the matter.

WATER SUPPLY

Governor Ratifies Wanaque Project.

Trenton, N. J.—In a formal communication addressed to the State Water Supply Commission Governor Fielder has officially approved the plans of the commission for the development of the Wanaque watershed for the joint use of municipalities entering the project. Such action by the governor is a necessary preliminary to the issuance of bonds for the development. The commission has received an application from the borough of Ridgewood, requesting that it be included in the list of municipalities to be supplied from the Wanaque. The commission has held a conference with the attorney general's department to consider the form of the contracts and other details in connection with the development and also to discuss the application of the municipalities which desire to be included.

Big Dam Completed.

Lynn, Mass.—The Breed's pond dam, costing \$200,000, which will hold 2,000,000,000 gallons of the Lynn water supply, is completed. It is 110 feet high and 1,400 feet long. This dam and its smaller surrounding dams comprise part of the second largest single storage reservoir in Massachusetts, the largest being the immense valley of the metropolitan system. By next year at this time the basin will be full. At present, however, the expanse consists of the fine gravel floor of the reservoir, upon which the 50 feet mean depth of water will rest. Water Commissioner Campbell looks upon the completion of this reservoir as marking nearly the end of extension of the system. The pipe line workers, who are doing the second big portion of the work, are almost at the Ipswich river. Then will come the work of sinking an intake basin and building a pumping station on the banks of the river. This work will start early in the fall and continue as long as the weather permits, to be completed early in the spring. By next April at the latest the pumps will be working and Lynn's water extension will be complete.

Water Waste Figures.

Schenectady, N. Y.—Following complaints of lack of water and low pressure, commissioner of public works Joseph H. Clements and Secretary A. T. G. Wemple said that the situation was probably due to the extensive use of water for sprinkling lawns or to waste from leaving faucets running. A record use of water for the department was made one day last month when 22,000,000 gallons were consumed. With a population of 80,000 this would mean a consumption of about 270 gallons per capita. The average consumption is about 12,000,000 or 13,000,000 gallons per day, it is said. After the Bevis Hill Reservoir is completed the pressure will be equalized to a large extent, it is believed, and the loss of pressure through the exclusive drawing off of the supply on lower levels will be offset by the surplus at the reservoir. Until that time, however, the officials have requested water users to be as economical as possible. Work is progressing steadily on the preparations for installing new pumps at the pumping station and replacing old pumps and worn out machinery. These additions are necessitated by the extra work which will have to be done to pump the water to the reservoir.

Salem, O.—Service Director I. N. Russell, who has just completed reading the meters for the past three months, estimates that 200,000 gallons of water is wasted every 24 hours through the leaks which he found in making his rounds throughout the city. There are now 560 meters in the city, and the pumpage since the installing of the meters

has been greatly diminished at the pumping station. As soon as the appropriation for the last six months of the year has been received about 300 more meters will be installed.

Newburgh, N. Y.—Rough estimates of Assistant Superintendent Gilchrist of the water works and inspectors who have been going from house to house since June 15 show that the daily consumption of water here has been reduced at least a million gallons a day as the result of the discovery and abolition of 537 leaks of various sizes. The daily consumption here is about five millions of gallons. Supt. Stanton said that the inspection was satisfactory though the results gained are only temporary. He insists that the only way to prevent leaks is to install meters.

Greensboro, N. C.—The hot spell is causing excessive water waste, the daily average consumption now being 2,250,000 gallons. The number of gallons used during the cooler months is about 1,500,000 per day. At present every pump at the Reedy Fork pumping station is working day and night to prevent the water supply from getting low and, although there is plenty of water for any and all emergencies that may arise, commissioner of public works J. Giles Foushee states that the waste is needless and in direct violation of certain sections of the city code. Commissioner Foushee states that unless the people of the city were more careful in the immediate future a start would be made to put all consumers on a meter basis, because the cost of coal for operating the pump is assuming too large proportions.

Fort Worth Proposed System.

Fort Worth, Tex.—Immediate completion of the Lake Worth conduit is recommended by Consulting Engineer Holman in a report filed with Mayor Tyra that is preliminary to the final report on the waterworks survey begun May 1 by Holman & Laird of St. Louis. The report also recommends the abandonment of the settling canal that was contemplated in the original plans of the reservoir system, and the installation of an aerating fountain at the outlet of the conduit from the dam. These recommendations, if adopted by the city commission at once, will mean the early completion of the conduit and the actual distribution of water over the city mains from the big million-dollar reservoir for the first time since it was completed two and a half years ago. The Hedges Construction Company of Springfield, Mo., contractors for the conduit, agreed to complete the conduit and guarantee it for a period of one year, promising to keep the pipe line in repair during that time without cost to the city. While several tests of the section of the concrete conduit nearest the reservoir have proved unsatisfactory to the city commission, Engineer Holman makes the statement that the pipe will gradually knit together through chemical re-

actions and clogging from the reservoir water until leakage will be reduced to a minimum. Holman estimates that the conduit will furnish 15,000,000 gallons of water a day at the filter plant, exclusive of leakage. The estimated daily consumption of the city is 10,000,000 gallons. A conference of citizens at the Chamber of Commerce last winter, to which members of the outgoing and the incoming city commissions were invited, obtained a pledge from the officials and the then officials-to-be that a firm of engineers from out of the city would be engaged to make a survey of the waterworks. It was estimated that the waterworks survey would cost \$2,000. It already has cost nearly \$3,000.

Progress on New Plant.

Hibbing, Minn.—M. E. Layne of the Houston, Tex., firm, which has the contract for the \$400,000 water system to be installed here announces that rapid progress has been made towards the completion of the system. He says more than 2,000,000 gallons of water is developed and ready for delivery. Four wells have been completed and two more are under construction. Burns & McDonnell of Kansas City, who have charge of the construction work for the new water system, announce that the contracts for all work, including the reservoir, powerhouse and laying of the water mains from the wells to the reservoir and from the reservoir to the water tank at Hibbing proper, have been let to the E. W. Coons company, local contractors. According to O. J. Ogran, who is superintending the well drilling, two more wells now under construction are almost ready for testing. With the completion of these two wells it is expected the entire 3,000,000 gallons of water daily, contracted for, will be developed.

Waterworks Statistics.

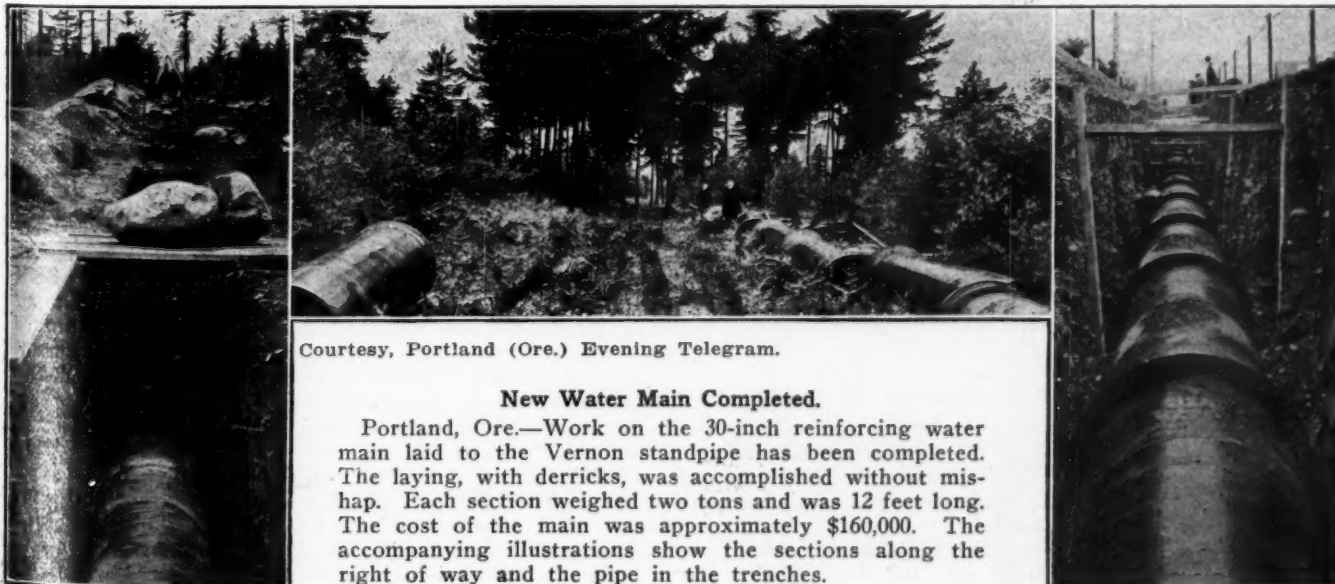
Saginaw, Mich.—The financial report of the water department for the past fiscal year submitted to the council by Commissioner Robert F. Johnson, of the department of light, water and sewers, shows fine progress in additions to property, increase in credit balance and reduction of the bonded debt. The city is \$73,380.06 ahead on the year on the water department. The items are as follows:

Added to property	\$39,627.34
Added to credit balance.....	8,552.72
Bonded debt reduced	25,200.00

Total \$73,380.00

The report is considered the best that the department has ever made. At the east side pumping station the average daily pumpage was 6,461,801 gallons, while at the west side station it was 3,423,412 gallons.

Hartford City, Ind.—The annual report of the city waterworks, from July 1, 1914, just completed by City Clerk Edwin McEldowney, shows that this city has raised its finances nearly \$2,000 and has made a number of large



Courtesy, Portland (Ore.) Evening Telegram.

New Water Main Completed.

Portland, Ore.—Work on the 30-inch reinforcing water main laid to the Vernon standpipe has been completed. The laying, with derricks, was accomplished without mishap. Each section weighed two tons and was 12 feet long. The cost of the main was approximately \$160,000. The accompanying illustrations show the sections along the right of way and the pipe in the trenches.

repairs in the system throughout the city. This city is fortunate in being provided with an excellent and abundant water supply at all times of the year. It supplies the fire protection free to all in the city whether or not they are customers of the waterworks department. The report in full, which is to be sent to the utilities commission in Indianapolis, is as follows:

Pumping department (including operating labor, \$1,325.50)	\$1,985.59
Steam generation account (including operating labor, \$1,084.42; cost of fuel, at \$2.95, \$2,762.85) ..	4,001.61
Distribution system (including labor, \$864.51)	1,423.11
Commercial expense	139.28
General expense	742.47
Undistributed accounts	438.33
Total operating expenses and materials	\$8,730.39
Construction:	
New work and improvements to plant	\$1,927.86
Miscellaneous construction expense	253.08
Water works bonds and interest	855.00
Total cash paid out	\$11,769.33
Operating Revenues:	
Earnings from commercial sales	\$8,975.77
Earnings from industrial sales	1,830.33
Earnings from street sprinkling	104.30
Earnings from flooding sewers	40.00
	\$10,950.40
Receipts from city taxes	\$2,175.68
Receipts from taps	355.00
Miscellaneous receipts	24.34
Total	\$2,555.02
Total revenues for year	\$13,505.42
Total expenses for year	11,769.33
Total surplus for year	\$1,736.09

Balance Sheet.

Assets.	
Appraisalment first of year	\$105,044.51
Construction current year	1,927.86
Cash	3,030.80
Bills receivable	3,161.45
Store room inventory	300.00
Prepaid insurance	133.34
	\$113,597.96
Liabilities.	
Investment	\$95,044.51
Bonds outstanding	9,200.00
Notes and bills payable	377.82
Surplus	8,975.63
	\$113,597.96

Twelve Years to Complete Water Project.

Los Angeles, Cal.—The city of Los Angeles has asked the State Water Commission at San Francisco to allow twelve years for the completion of its water supply projects, and to hold in reserve a number of matters which it deems essential to the completion of its plans, until it is in a position to incorporate everything in its projected system of operations. The city wants to have its entire scheme of water development in the Owens Valley and Mono section considered as a unit, although rights of way and easements must be secured at various points in the forest reservations. The completed project contemplates a constant delivery of 400 second feet of water in the Los Angeles aqueduct and the generation of 238,800 horsepower in plants to be located along the aqueduct on Division Creek, Cottonwood Creek, Big Pine Creek, the Owens River Gorge and on Rush and Leevining Creeks in Mono County. Officials in charge of the Los Angeles aqueduct and power development project have been in conference with representatives of the State Water Commission and of the United States Forestry Service. Those present were: F. H. Fowler, District Engineer of the Forest Service; C. S. Brothers of the Land Department of the Forest Service; E. B. Matthews, Chief Counsel for Los Angeles; W. H. Himrood, Assistant to the Chief Counsel; E. P. Scattergood, Electrical Engineer in charge of construction work, and State Water Commissioners W. A. Johnstone, A. E. Chandler and Irving Martin.

Public Service Commission Decides Meter Question.

Chester, Pa.—Two features of benefit to the small users of water in this city stand out in the decree just handed down by the state public service commission in the suit of the city of Chester and certain property owners against the New Chester Water Company. The people have won the right of a flat meter rate of 50 cents per month instead of \$1 which the water company had decided to charge and the decree of the state board abolishes the

landlord's liability for the payment of the water consumed by a tenant. The rates are in effect and the water company has now the right to instal meters upon every property where water is used. When the water company some time ago announced that it intended to instal meters upon all properties and charge \$1 per month flat rate for the same, a protest was entered by every small property owner and user of water. The local courts temporarily enjoined the company from doing this and then the city joined with the property owners and the case was called to the attention of the State Public Service Commission to have that body fix the rates which the water company must charge. The right of the company to meter all properties was conceded by those who opposed the raising of the minimum meter rates and making the landlord responsible for the payment of the water rents. The water company fought hard to have the landlord rule accepted but was unsuccessful. The company raised the question of irresponsible tenants moving out of houses without paying the water rent. In a measure the commission has decided this by giving to the water company the right to exact from every user of water a deposit of \$3 before the water is turned on.

Win Long Rate Fight.

Lake Forest, Ill.—After ten years of litigation in common law courts the city of Lake Forest has won a fight against the Lake Forest Water Company for a reduction of rates before the state public utilities commission. The decision of the commission grants an even greater reduction in water rates than the city had asked. A saving of more than \$8,000 a year for water consumers of the suburb will result, according to George T. Rogers, city attorney. The city sought to compel the water company to reduce its rates from 25 cents a thousand gallons to consumers to 20 cents. The utilities commission, exercising the authority given it by the utilities law to fix and regulate rates of public utilities companies, cut the rate to 18 cents. Trouble between the City of Lake Forest and the water company started in 1904. Prior to that time the water rate had been graduated. At that time the company served notice of an increase to 25 cents for meter consumers, leaving the rate of \$40 for each 500 feet of main for hydrant purposes for the city unchanged. A year later, in 1905, the city passed ordinances fixing the water rate at 20 cents for consumers and \$40 for 500 feet main for the city. A suit to enforce this ordinance was brought in the Cook County circuit court, went to the Supreme Court and was remanded for further evidence. The suit was back in the Circuit Court of Cook County when the public utilities law went into effect Jan. 1, 1914. At the suggestion of Circuit Judge Donnelly, and on motion of City Attorney Rogers of Lake Forest, this suit was abated and a petition was filed in the utilities commission.

STREET LIGHTING AND POWER

Columbus Light Plant Successful.

Columbus, O.—For the fourth time in the one case, City Solicitor Scarlett secured a decision in favor of the municipal light plant, when the Court of Appeals sustained the decision of the Common Pleas court in the case James M. Butler and Max Goldsmith brought against the plant to make it stop selling current for commercial purposes. Butler claims the plant is selling at rates which are actually below cost of production. Judge Bigger held that municipally owned plants have the same right as private plants to fix a rate below cost to get customers if the rate is one which, when many customers are secured, will be profitable. Butler and Goldsmith then carried the case to the Court of Appeals.

Expert accountants Nau, Rusk & Swearington of Cleveland and New York, in their report on the plant submitted to Service Director Borden, find that there would now be a surplus of \$286,658.37 in the Columbus municipal light plant treasury if it had, since its establishment in 1899, received from the city for street lighting the rates charged Cleveland by the private lighting company there, and had paid out of these receipts all the money the city has paid out for it. The-

report is made under the regulations of the Ohio public utilities commission and is to be used in installing at the plant the system of uniform accounting for public utilities ordered by the commission. Under this order, all public utilities of the state, both privately and publicly owned, must have the same system of accounting so comparisons of costs and rates can be made. The accountants used as the valuation of the plant, the cost price of the equipment and possessions, minus the depreciations figured as the private companies figure it. On this basis the valuation is placed at \$748,636.52. The report points out at its conclusion that, when the new set of books ordered by the public utilities commission are opened at the light plant, they will start with the entry that the city owes the plant \$286,658.37. In the valuation of the city's light plant every item that a private concern would include has been figured in. These items comprise rent for land occupied, taxes, water used, pro rata share of the city administration (mayor and other officers' salaries) and many other things for which, in actual practice the plant never paid a cent. Against this total, which represents a debit account of \$1,301,078.56, the plant is credited with the light it furnished the city at the same cost the city was paying when it bought part of its current, or the cost in other cities since the city has supplied all its own current. To this figure was added the actual revenues arising out of the sale of current. The estimated value of current supplied the city from 1899 to Jan. 1, 1915, is \$1,528,246.77. Since 1911 the receipts from commercial current have ranged around \$45,000 a year. Independent of its connection with the city and the benefits it has created for the city, the plant shows earnings of \$213,326, it is declared.

Charges Against Plant.

Total payments of interest on bonds.....	\$335,780.07
Bonds retired by city.....	13,000.00
Disbursements from annual revenues made by city for operating and maintaining light plant.....	604,257.11
Payments from flood emergency bonds by city for plant.....	33,440.85
Taxes foregone, both real and personal.....	91,864.34
Excise taxes to state.....	18,831.20
Water from water works not paid for.....	8,245.90
Payments for cluster light system.....	146,000.00
Rent to water works for land on which plant is built.....	6,554.04
Proportion of general administration expense chargeable to plant.....	43,100.00
Total.....	\$1,301,078.56

Credits of Plant.

Bond interest paid by plant.....	\$2,242.24
Street lighting furnished to city.....	1,528,246.77
Total.....	\$1,550,489.01

The rates at which the city is charged for lighting the streets for each succeeding year, beginning with 1899, are as follows: \$74.50 per lamp, \$74.50, \$74.50, \$74.50, \$74.50, \$70.50, \$70, \$68, \$65, \$55, \$55, \$55, \$55, \$54, \$52, \$50, \$50.

Kansas Natural Gas Rate Case.

Topeka, Kans.—The Kansas Public Utilities Commission at Topeka has made an order granting a flat increase of three cents a thousand cubic feet of the Kansas Natural Gas company and the distributing companies. Coffeyville and Independence are the only cities in which the rate will not be raised because they are situated in the gas belt, and Fort Scott, Bronson and Moran because their rate is already 30 cents per thousand. The order will advance the price of gas for domestic consumption from 25 cents a thousand cubic feet, net, to 28 cents a thousand cubic feet, net, at all places served by the Kansas Natural Gas company where the rate is now 25 cents, net; will establish a monthly minimum charge of 50 cents at all places, this minimum charge to be retained in full by the distributing company; requires industrial manufacturing gas to be supplied to consumers without discrimination at existing rates, when it can be done without interfering with the supply of domestic consumers; prohibits, as discriminatory, the supplying of gas free to cities for use in city offices or school buildings, where such gas was required to be provided by the terms of franchise ordinances; provides for the issuing of the order only when a simultaneous advance is made in Missouri, as more than half of the gas supplied by the Kansas Natural Gas company is

marketed and consumed in that state. The increase in the price is asserted by the commission to be sufficient for the receivers to make all the necessary extensions to get a sufficient supply to furnish gas to the maximum capacity of the pipe lines. This, of course, is not sufficient to give all of the gas needed in all of the towns for heating and cooking in the coldest weather. The new rate will increase the revenues of the Kansas Natural nearly a quarter of a million dollars a year.

Application for an increase in rates was filed with the commission in April. Testimony was taken in May concerning the allegation of the gas company receivers that in view of the gas supply they were entitled to a sliding scale increase in rates, based on distance of delivery from the wells. It was asserted by the receivers that returns from the 1914 business showed a loss of \$1,300,000 on rates in force last year. Permission was asked of the commission for the cancellation of all contracts for gas for commercial purposes. Receivers for the company stated that if the increase in rates was granted \$600,000 would this year be spent for improvements and betterments. Some twenty-five towns were affected by the application of the receivers. They sought to force the distributing companies to make betterments on their lines and prevent loss of gas through leakage. Topeka, Lawrence, Leavenworth, Kansas City, Atchison, Oakland, Merriam, Olathe, Edgerton, LeLoup, Princeton, Welda, Fort Scott, Parsons, Pittsburg, Weir, Columbus, Altamont, Coffeyville, Mound City, Elk City, Tonganoxie, Baldwin, Rosedale, Lenaxa, Gardner, Wellsville, Ottawa, Richmond, Colony, Thayer, Galena, Cherokee, Scammon, Oswego, Liberty, Caney, Mound Valley, Independence and Redfield are affected by the order in the case. The gas case controversy just decided is but another link in a long chain of litigation over gas receiverships and rates. The cases had an inning in the state supreme court and found their way to the United States district court and circuit court. Then they jumped to the supreme court of the United States. Twice the case has been before the Kansas public utilities commission. Three years ago the commission announced its first decision in the case.

Arbitrators Decide Gas Rate.

Flint, Mich.—The gas question was settled by the board of arbitrators, who have decided to fix the price for the five years beginning April 21, 1915, at a maximum rate of 85 cents per 1,000 cubic feet for the first 5,000. The verdict was signed by Hon. Edwin O. Woods and Dr. Orson Millard, the city's representatives on the board, and Neil J. Berston, Sr., who was chosen by an agreement reached between the city and gas company arbitrators. Clinton Roberts and George E. Pomeroy, the arbitrators chosen by the gas company, refused to sign the report. In the early part of the arbitration an attempt was made by the gas company to effect a settlement. An offer was made by Attorney Carlton on behalf of the company whereby the first 2,000 cubic feet of gas would be sold for 90 cents and 85 cents per thousand after that. This was rejected by the city's representatives. The finding makes no change in the present schedule of rates above 5,000 cubic feet per month. This leaves the sliding scale for commercial or industrial purposes, which now reaches as low as 45 cents in very large quantities, entirely in the hands of the company. While the rate is not as low as the council expected, it has voted to accept the decision of the arbitrators. The council is now to seek a rate reduction from the Flint Electric Company.

FIRE AND POLICE

Fire Hazard in New York Subway.

New York, N. Y.—Action will soon be begun by the fire department in bringing about absolutely fireproof conditions in the subway, in accordance with the recommendations made by the board of inquiry picked by Commissioner Adamson, upon the mayor's request. The board found that too much inflammable material was allowed to accumulate in the subway, such as wooden cars, wooden third-rail guards, wooden ticket booths and newspaper

stands, and wooden doors. The board consisted of Fire Chief Kenlon, Putnam A. Bates, chief of the bureau of fire alarm telegraph, and J. O. Hammitt, chief of the bureau of fire prevention. Besides the wooden material, the board reports it found quantities of gasoline, kerosine and other inflammable material stored in the subway. The board recommends a source of current supply for the lighting, power, ventilating, signalling, fire alarm and telephone systems apart from the source of power current; the installation of a complete fire alarm system connecting directly with Fire Headquarters, a system of emergency lights supplied with current from storage batteries; telephones every 500 feet along the subway walls; more openings to the street, with two five-foot iron stairways in each; the construction of longitudinal walls between tracks, and the removal of all wooden cars.

New Alarm Systems.

Monroe, La.—Mayor H. D. Apgar and a committee from the city council have returned from Jackson, Miss., where they went to inspect the fire alarm system in use in that city with a view of installing a similar plant in Monroe. The plans call for twenty boxes located throughout the thickly built section of the city. The system will be gradually extended to cover the entire city. By putting in a fire alarm system insurance rates will be greatly reduced. It is estimated that the savings on insurance will pay for the system in two years.

Hagerstown, Md.—The installation of the new Gamewell police call system has been completed. The officers have been instructed in the use of the system, which is calculated to greatly increase the efficiency of the department.

GOVERNMENT AND FINANCE

New Mayor Finally Chosen in Nashville.

Nashville, Tenn.—After more than five hundred ballots, the three city commissioners left, Alexander, Stainback and Marshall, after the ousting of Mayor House and Commissioner Elliott, have finally agreed on Judge Robert Ewing for mayor and J. O. Tankard for commissioner. Stainback and Alexander continually voted for Boyte Howell for mayor and Tankard for commissioner, while Marshall was pledged to vote for two men in a selected list of members of the Commercial Club. Attorney Harry S. Stokes, who is representing the people, made several attempts to enjoin the commissioners from filling the vacancies, charging the Commercial Club with bad faith and holding that the people should elect the new members of the commission. He succeeded in getting an injunction preventing Alexander from voting, but the decision was superseded by Judge Wilson of the Court of Civil Appeals. Meanwhile the inquiry into the actions of the ousted officials continues. Judge S. F. Wilson decided not to modify his supersedeas on the order of Judge Allison appointing a receiver for the city. This forced Attorneys Stokes and Cherry to bring the question before the State Supreme Court in special session. They attempted to have this supersedeas vacated and also the order granted by Circuit Judge Thomas E. Matthews in the "ouster" proceedings. The Supreme Court decided that the suspension of Mayor House and Commissioner Elliott was legal; that the injunction to prevent Alexander from voting was illegal and void; the Court refused to grant a receivership for the city and upheld Judge Wilson.

Hibbing's Tax Troubles.

Hibbing, Minn.—With practically its entire revenue withheld by the refusal of the Oliver Iron Mining Company and its subsidiaries to pay delinquent taxes amounting to \$750,000, Hibbing, in the great Mesaba iron range, in St. Louis County, faced for some days the complete cessation of municipal activities. Mayor Victor L. Power, at a conference, requested that Governor Hammond declare martial law for the municipality or convene a special session of the legislature to consider the passage of remedial laws. The governor could find no precedent for these actions. The companies charge the village officials with absurd use of the 2 per cent tax levy and scandalous extravagance with

the resulting revenue. According to figures given out by the companies, "These companies pay more than 97 per cent of all the taxes raised in the Hibbing district. They have nothing whatever to do with the levying of these taxes which they pay, nor with the spending of the money after it is collected. No officer or employee of any of the companies is connected with the village government. The companies have never attempted to run Hibbing, and have not the slightest desire to do so. The average per capita tax levied in 1914 in all of the 140 villages and cities of the third and fourth class in Minnesota of over 900 inhabitants, not on the range, was \$5.35. The Hibbing levy for 1914 was \$85.35 per capita. Hibbing actually expended during its fiscal year ending January 31, 1915, \$1,204,742, which amounted to \$136.40 per capita. The authorized levy in Hibbing for 1915, as forecast by the action of the village council last February, is \$191.79 per capita. The proposed expenditure on this basis is \$1,693,933." Mayor Power denied the charges of extravagance. He said mining companies were aiding in piling up the debt against the city, as their refusal to pay only compelled the issuance of city orders and the use of such meant that the village had to pay two prices for everything it required. Finally a conference was held between the village and company officials, the village council being represented by four of its five members, John Curran, Rupert Swinnerton, B. J. Burrows and D. D. Haley. It is understood that the village officials held out for the demand of Mayor Power—\$25,000 a month for general running expenses of the village government and enough money to complete the Alice sewer; while the mining companies were willing to agree to \$20,000 a month for running expenses and enough to complete the Alice sewer, and also that Hibbing shall have a garbage incinerator.

Further reports state that the conferences were unsuccessful, no agreement resulting. Mayor Power has finally announced that action is to be instituted to prosecute the company for alleged gross misdemeanors and to seize all ore shipped from Hibbing and to sell it to satisfy the taxes.

Birmingham in Financial Straits.

Birmingham, Ala.—A much pruned budget, resulting in threatened serious reductions in all branches of the city government, caused the resignation of Dr. Cunningham, health officer, and the expected withdrawal of others. The heads of all departments submitted plans for the reduction of work and expenses, at the same time warning of resulting inefficiency. The city officials asked that the county refund \$200,000 of the \$505,725.19 paid by the city into the county treasury of which the city gets in return less than 50 per cent. Birmingham pays 66 per cent of the taxes collected by Jefferson County. The legislature responded by introducing a measure calculated to give relief by increasing the tax rate of the city.

Duluth Government Illegal.

Duluth, Minn.—Duluth city is now, and has been for the last two years, living an illegal municipal existence. This is the gist of a sweeping, far-reaching decision handed down at St. Paul by the Minnesota supreme court. The state's highest tribunal has decided: That Duluth's preferential system of balloting, under which all municipal elections have been held since April, 1913, is invalid and unconstitutional; that Duluth is now, and has been since the first election under the new charter providing for a commission form of government, governed by a de facto mayor and a set of de facto officers; that District Judges Dancer and Fesler were mistaken in holding that W. H. Smallwood, municipal judge elect, was entitled to hold the office to which he was elected under the preferential system. The high court has passed on three election contests under the preferential system of balloting, but heretofore has evaded the direct issue of whether Duluth's preferential system of voting is constitutional. Justice Hallam of the supreme court dissents from the majority opinion and calls attention to the fact that if the majority decision is right, none of the officers elected since April, 1913, have a semblance of right to the offices which they are now filling. The case in which the sweeping decision was handed down was an election contest instituted by John Brown, Jr., against W. H. Small-

wood, municipal judge-elect. In the trial court, the main question appeared to be not the constitutionality of the preferential system of balloting as applied to municipal offices, but its application to the offices of municipal judge, which the contestant claimed was not a municipal office but a state office. In view of the decision it is probable that immediate steps will be taken to amend the city charter so as to provide a legal method of voting. Attorney Phelps, for Judge Smallwood, has applied to the supreme court for a rehearing.

Commission Wins by Majority of Two Votes.

Springfield, Mo.—After three unsuccessful attempts, Springfield has adopted commission form of government by a bare majority of two votes. The final vote was 1,963 for the proposition and 1,961 against. The \$50,000 sewer bond issue proposal, which was defeated at the elections in April and June, was defeated again this time by a majority of 528 votes. Although a majority of the voters of the city cast their ballots in favor of the sewer proposal, a two-thirds majority was necessary. The campaign was the hottest ever held in this city on a special question, and the total vote polled was unusually heavy. Advocates of the new form were confident of it carrying by a good majority, basing their confidence on the big majority of the election of June 2, which later was declared invalid, owing to the fact that no previous registration had been held. However, strong opposition sprang up in several of the wards. The new form will not be effective until the end of the present administration, next April. Commissioners will be elected at that time instead of the officers of the present form of government. At the primary two candidates will be chosen for each of the elective offices, mayor, four commissioners and municipal judge. These will be voted on at the election to follow.

City Wins Novel Tax Suit.

Harrisburg, Pa.—After a disagreement of nearly a dozen year's standing between Harrisburg and the Adams Express Company, it was finally decided by the Superior Court in favor of the city. By reason of the decision, the city's coffers will be enriched by close to \$100. The chief importance is that this city has established a precedent that may be followed by another city in Pennsylvania. The city held the horses of the company within the city should be taxed. An assessor thought they should in 1901, and applied the general tax levy to the animals of the Adams Express Company. The company's defense was that it was not liable for any municipal tax because it was an inter-State corporation engaged in a public service business, and that horses were as much exempt as the rest of its holdings here. In an opinion Judge Kunkel decided that the company was liable for the tax, amounting to 9 mills on the value of the horses.

Finances of City of Manila.

Manila, Philippines.—Figures recently made public by the Insular Auditor show that the city of Manila, except for moneys received from the Insular Government, is spending each year more than its revenues. During 1914 the city's total revenue from taxation fell off \$62,396.04, as compared with its receipts for the preceding year, while the total net income of the municipality was \$174,652.41 less than during the preceding 12 months. During this same year \$13,427.42 less was spent for general government and administration than during the preceding year; \$188,299.28 less was spent for the protective service of the city; \$56,904.40 less was spent in social improvement; \$72,769.46 less in economic development—so that the revenue deficit, while \$551,948.19, was less than that for 1913 by \$279,137.66. The gross revenue of the city, plus the annual contribution of the Insular Government, for 1914 amounted to \$1,704,156.18, and the net expenditures were \$1,631,104.37. The contribution of the Insular Government mentioned is in exchange for services rendered the Insular Government by the city. The revenues of the city are therefore insufficient to meet its needs, for had it not been for the contribution of \$625,000 from the Insular Government there would have been a deficit of \$551,948.19. The revenues are insufficient to cover the ordinary functional expenses of the government, to say nothing of fixed charges and public works.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Territorial Division—Detachment of Territory.

Platt Press & Fire Brick Co. v. Incorporated Town of Van Meter.—In a suit to sever territory from an incorporated town, a finding of the trial court upon the facts, refusing such severance on the ground that the territory was necessary for sanitary and police purposes, has the effect of a verdict of a jury, and will not be disturbed, in the absence of abuse of discretion.—Supreme Court of Iowa, 153 N. W. R., 178.

Claims—Notice—Extent of Claim.

Mayor and Council of Mercer v. Springfield.—As a prerequisite to bringing a suit against a municipal corporation in this state for injury to person or property, a demand in writing must be presented to the governing authority of the municipality for adjustment, stating the time, place, and extent of the injury, as near as practicable, and the negligence which caused the same. Pol. Code 1910, § 910. A notice which fails to specify any amount of money as damages is not a compliance with this requirement.—Court of Appeals of Georgia, 85 S. E. R., 684.

Segregation of Races—Police Power.

Harris v. City of Louisville; Buchanan v. Warley.—The race segregation ordinance of the city of Louisville, which prohibits any colored person from occupying as a residence or place of assembly for colored people a building in any block in which the greater part of the houses are occupied by white persons, and vice versa, but which provides that it shall not affect the location of residences or places of assembly made previous to its enactment, nor prevent any person who has heretofore acquired a building for a residence or place of assembly from exercising such right, does not take away the right of alienation, but is merely a restriction on alienation by taking away the probability of alienation to certain classes of producers, and, as such, cannot be held to deprive the owner of a vested right.—Court of Appeals of Kentucky, 177 S. W. R., 472.

Public Improvements—Special Assessments—Petition.

Harn v. Oklahoma City et al.—In an action for injunction against a city of the first class, its mayor and councilmen, and a street improvement contractor, seeking to restrain the collection of assessments against plaintiff's lots to pay for street improvements made by such city, where the petition of plaintiff fails to show any act remaining to be performed by such city, its officials or the contractor, necessary to the collection of such assessments, but shows that the same have been certified to the county clerk, and by him spread on the tax rolls of the county, and are about to be collected by the county treasurer, and the only affirmative relief sought is an injunction against said county clerk and county treasurer collecting said assessments, such petition wholly fails to state a cause of action.—Supreme Court of Oklahoma, 149 P. R., 868.

Public Improvements—Ordinances.

City of Waukegan v. Burnett et al.—An ordinance for the paving of a street, which provided that parkways should be graded so as to coincide with an established line, but that no grading was to be done where there were no sidewalks, is not invalid on the ground that it was uncertain as to the amount of grading to be done. The estimate of cost on which the ordinance was based is not defective in failing to separately state the cost of labor in construction, where it states generally that it includes all labor, materials, and other expenses, and it specifies the materials entering into the improvement. An estimate of cost of the improvement is sufficiently itemized if it gives the property owners a general idea of the cost. Hence the estimate is not defective where it gave the total number of cubic yards of grading, although the ordinance itemized the grading.—Supreme Court of Illinois, 109 N. E. R., 277.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS.

Highways.

Practice of Road Work. Extracts from paper relating to various features of country road construction, such as the use of binders, spreading of the metal, protection at the sides, operation of road roller, etc. By R. Drummond. 1,300 words. Canadian Engineer, July 1. 15 cts.

New Jersey Road Experiences. Conclusions derived from experimental roads; concrete foundations for bituminous pavements; bituminous mortar surfaces. 1,750 words. Municipal Journal, July 1. 10 cts.

Construction and Maintenance of New York State Highways. Review of the 1915 report of the advisory board on highways to New York State Department of Efficiency and Economy. By A. H. Blanchard. 3,000 words. Contract Record, August 4. 15 cts.

Connecting Roads to Mountain Parks, Denver, Colo. Describes work now in progress and that already completed and shows methods of construction used. By O. B. Thum. 9 ills., 1,500 words. Municipal Engineering, July. 25 cts.

Superelevation of Curves on Highways, Illinois Practice. Where brick and concrete pavements are used almost exclusively. 900 words. Engineering News, July 8. 15 cts.

Construction.

Economic Material Handling on Large Road Contract. Use of special paving mixer and industrial railway equipment eliminates rehandling of material. By Stanley E. Bates. 5 ills., 2,000 words. The Contractor, August 1. 20 cts.

Operation Analysis of New Machines Which Cheapen the Moving of Earth on Road Work. Light steam shovel efficiently used in cuts of moderate depth and in removing old paving and surfacing; cost of operating dirt-handling machines. By A. B. McDaniel. 4 ills., 2,500 words. Engineering Record, July 31. 20 cts.

Aggregate for Road Job Is Handled Mechanically from Pit to Road. Stored in elevated bins at main plant and at job; design of special mixer. 4 ills., 1,000 words. Engineering Record, July 31. 10 cts.

Convict Labor.

Road Construction in Reading Township, Ill., with Convict Labor. Describes superintendence, equipment, convict camp, sanitation and camp rules. By D. H. Plepmeier, engineer in charge of maintenance. 8 ills., 3,500 words. Engineering and Contracting, July 14. 10 cts.

Materials.

Road Material Resources of Ontario. Notes on the geological report on the occurrences of suitable sand, gravel and stone throughout the province. 2,000 words. Canadian Engineer, July 22. 15 cts.

Proposed Standard Definitions of Road and Pavement Materials. Definitions of various bituminous and non-bituminous materials as recommended by American Society for Testing Materials. 1,300 words. Canadian Engineer, July 1. 15 cts.

Report of Committee D-4 of the American Society for Testing Materials on Standard Tests for Road Materials. 9,000 words. Better Roads and Streets, August. 15 cts.

Maintenance.

Some Recent Experiences in the Maintenance and Resurfacing of Roads. Particularly on Clay Subsoil in the Vicinity of London. By J. A. Webb. 3,000 words. The Surveyor, July 9. 10 cts.

Patrol System of Road Maintenance and Repair in Pennsylvania. Describes method of road maintenance; gives rules and duties of patrolmen. 1,500 words. Engineering and Contracting, July 28. 10 cts.

Economics of Pavement Repairing. Providing a roadway for an indefinite

continuous period at minimum expense; method of determining limit beyond which cost of maintenance by repair exceeds that of renewal. 3 ills., 2,500 words. Municipal Journal, July 1. 20 cts.

Asphalt.

Binder Course in Asphalt Pavements. Experience in asphalt pavement repairs which show the value of a real binder course. By Robert Klotz. 1,200 words. Engineering News, July 1. 15 cts.

Motor Trucks in Asphalt Paving Service for Chicago Contractors. Modern hauling methods permit stationary plant to mix asphalt for distant paving work. 8 ills., 2,000 words. The Contractor, July 15. 20 cts.

Pittsburgh's Municipal Asphalt Plants. Two plants, one eight years and the other one year old, laid more than 400,000 square yards last year; description of plant; street equipment. 3 ills., 1,100 words. Municipal Journal, July 29. 10 cts.

Production of Trinidad and Bermudez Lake Asphalts. By C. N. Forrest, chief chemist, Barber Asphalt Paving Company. 13 ills., 5,000 words. Better Roads and Streets, August. 15 cts.

Brick.

Brick Road Built Monolithic at Paris, Ill. Paving blocks were laid directly on green concrete base, thereby eliminating necessity for sand cushion. By W. T. Blackburn, engineer, Dunn Wire-Cut-Lug Brick Co. 3 ills., 1,200 words. Engineering Record, July 10. 10 cts.

Brick Pavement Design. Discusses wearing surface, foundation, sand cushion and the advantages of proposed new method of construction; relative costs of methods. By W. D. P. Warren, consulting engineer. 5,000 words. Engineering and Contracting, July 7. 10 cts.

Brick and Stone Pavements Without Sand Cushion. 500 words. Engineering News, July 22. 15 cts.

New Practice in Brick Pavement Construction. Description of method of laying on mortar bed, eliminating sand cushion. By F. A. Churchill. 2 ills., 3,000 words. The Highway Contractor, July. 10 cts.

Developments in the Manufacture and Use of Brick. By W. D. Alsip, President, Alsip Brick, Tile and Lumber Co. 1,500 words. Contract Record, August 4. 15 cts.

Concrete.

Perfecting Concrete Roads. The part that hydrated lime plays in assuring absolute permanency to concrete. By Charles Warner. 2,000 words. Better Roads and Streets, August. 15 cts.

Method of Striking Off Wide Concrete Pavements and Those Having a Varying Crown. By H. Colin Campbell. 8 ills., 2,000 words. Engineering and Contracting, July 28. 10 cts.

Toronto-Hamilton Highway Construction. Progress on the 35-mile concrete highway along the lake shore between Toronto and Hamilton. Notes on camp arrangement and general features of design and construction. 5 ills., 1,700 words. Canadian Engineer, July 1. 15 cts.

Bituminous.

A New Type of Bituminous Concrete Paving. Description of Hassamite, method of laying and materials of construction. 1 ill., 1,000 words. The Contractor, July 15. 20 cts.

Iowa Experiments with Oil on Dirt Roads. Benefits, limitations and cost are discussed; cheap methods for eliminating mud and dust; when and how to apply oil. 3 ills., 1,200 words. Engineering Record, July 3. 10 cts.

Simply Constructed Tar-Macadam Road. Tar kettle and 3-ton roller about all the equipment necessary. 2 ills., 400 words. Engineering News, July 8. 15 cts.

Stone Block.

Use of Granite Block for Paving in Breslau, Germany. From report by United States Consul. 750 words. Contract Record, August 4. 15 cts.

Durax Pavement in Louisville. Experience with rolling with light and heavy rollers; sand, gravel and stone screenings as cushion materials; segment and straight courses. By D. R. Lyman, city engineer. 1 ill., 1,200 words. Municipal Journal, July 15. 10 cts.

Wood Block.

Wood Block Paving in the West. Typical method of laying wood block in British Columbia; specifications. 5 ills., 1,200 words. Contract Record, July 14. 15 cts.

Gravel.

Gravel and Its Uses in Highway Construction. By Paul E. Sargent, State Highway Engineer of Maine. 5,000 words. Southern Good Roads, July. 10 cts.

Macadam.

New Macadam Specifications of the City of Philadelphia. Illustrated. 4,000 words. Better Roads and Streets, August. 15 cts.

Miscellaneous.

State Should Deal Directly with Patentees of Processes and Materials in Public Work. Plan to prevent collusion between contractor and patentee suggests that highway department assume payment of royalties. By S. Whitney, consulting engineer. 2,000 words. Engineering Record, July 17. 10 cts.

Eliminating Tower-Grove Grade Crossing at St. Louis. An X-shaped reinforced concrete structure over two railroads. 6 ills., 2,400 words. Engineering News, July 8. 15 cts.

Apportionment of Cost of Highway Bridges Between Street Railways and Cities. Elements entering into the problem and the consideration which they should receive. By Charles M. Spofford. 4,000 words. Canadian Engineer, July 22. 15 cts.

Street Work in New York. Inspecting pavement repairs made by corporations; minimizing pavement cuts; determining when surfacing is necessary; sidewalk obstruction. 1,000 words. Municipal Journal, July 1. 10 cts.

Road Engineers and Heavy Traffic. Paper by E. J. Elford, Borough Engineer and Surveyor, Southend-on-Sea. 4,000 words. The Surveyor, July 9. 40 cts.

SEWERAGE AND SANITATION.

Treatment.

Operating Records of Atlanta Sewage Treatment Plant Show Adequate Degree of Purification. No trouble with scum in the tank or foaming in gas vents; sludge accumulation and floating debris have been eliminated; sprinkler nozzles clog infrequently. By C. C. Hommon, chemist in charge. 1 ill., 4,500 words. Engineering Record, July 3. 10 cts.

Typical Iowa Sewage Treatment Plant and Its Proper Operation. 1,000 words. Engineering and Contracting, July 7. 10 cts.

A Summary of the Results of Experiments on the Purification of Creamery Refuse and Their Application. By H. R. Crohurst, sanitary engineer, U. S. Public Health Ass'n. 5,000 words. Engineering and Contracting, July 7. 10 cts.

Constructing the Fitchburg Sewage Works. Very thin tank and filter walls of cement plaster on metal layer; cement block drainage system; description of sprinkling nozzles. By F. A. Marston. 6 ills., 1,800 words. Engineering News, July 1. 15 cts.

Brooklyn Sewage Aeration and Activated-Sludge Experiments. Description and summary of results of experiments with sewage aeration in a deep tank of unusual design, first without and then with activated sludge; also experiments with a small aerated contact bed. By E. J. Fort. 7 ills., 2,400 words. Engineering News, July 29. 15 cts.

Method of Adjusting Sewage Sprinklers. By A. T. Nabstedt. 1 ill., 900 words. Engineering News, July 29. 15 cts.

Three Residential Sewage Treatment Plants Near Cleveland. The three plants comprise (1) a two-story sedimentation tank and glass-covered rapid sand filters;

WATER SUPPLY.

Water Works.

An East African Water System. Describes water works and filtration plant at Delagoa Bay. By George A. Chamberlain. 1,500 words. Fire and Water Engineering, July 28. 10 cts.

Water Works at Valparaiso, Ind. Complete description of the plant and development of water company. By E. L. Loomis, superintendent. 7 ills., 3,500 words. Municipal Engineering, July. 25 cts.

Burlington Water Supply. 3 ills., 1,200 words. Fire and Water Engineering, July 14. 10 cts.

Pipe Lines.

Methods Employed in Maintenance of Water Distributing System of New York City. From a paper read by W. W. Brush before American Water Works Association, New York section. 6,000 words. Engineering and Contracting, July 14. 10 cts.

New Conduit of the Hartford Water Works. Gives general description of system and of the construction on the pipe line. By C. M. Saville, chief engineer. 3 ills., 4,500 words. Fire and Water Engineering, July 7. 10 cts.

Durability of Wood Pipe and Factors Affecting it. Extract from bulletin of the U. S. Department of Agriculture. 4,000 words. Engineering and Contracting, July 7. 10 cts.

Subaqueous Pipe Taken Up and Replaced 3 Feet Lower. Improvements on Neponset River work near Boston involved use of dipper dredge to raise flexible joint line. By E. M. Blake, engineer in charge. 2,000 words. Engineering Record, July 17. 10 cts.

Joint Details in High-Head Pipe Lines; Data on Pipe Lines Throughout the World. 5 ills., 2,000 words. Engineering and Contracting, July 28. 10 cts.

Cleaning Water Supply Main at Merced, Cal. Six miles of 16-in. main were cleaned by a go-devil. 1 ill., 900 words. Engineering News, July 22. 15 cts.

External Corrosion of Cast Iron Pipe. Gives examples of deterioration of cast iron pipe and describes the conditions under which this occurs. Discusses composition of cast iron; conditions inhibiting corrosion. From a paper by Marshall R. Pugh. 4 ills., 14,000 words. American Gas Light Journal, August 2. 10 cts.

Data and Discussion on Leakage from Cast Iron Mains. From report at annual meeting of Southwestern Water Works Association by Joseph W. Ivy, American Cast Iron Pipe Co. 3,500 words. Contract Record, July 28. 15 cts.

Cincinnati High-Pressure Fire Hydrants. Features of a design with detachable hose head. 1 ill., 900 words. Engineering News, July 22. 15 cts.

Water Works Practices and Costs. Prices paid for cast iron pipe; cost of laying pipe; depth of trench in various parts of the country. 1,100 words. Municipal Journal, July 29. 10 cts.

Purification.

Automatic Device Controls Hypochlorite Application. Apparatus for institutional plant proportions accurately the amount of chemical to varying flow of sewage. By E. E. Ludwick. 6 ills., 1,200 words. Engineering Record, July 24. 10 cts.

Value of Mechanical Filters in Water Purification. Consideration of character of water to be treated, as to suspended and coloring matter, iron, bacterial content, etc. 4,000 words. Canadian Engineer, July 8. 15 cts.

Montreal's Filter Problem. Review of design and construction of the 50 million gallon double filtration plant now under construction; proposals for further extension. 800 words. Canadian Engineer, July 8. 15 cts.

River Sand as a Filter Medium. Some interesting cost data covering the use of cheaper sand in slow and rapid sand filtration. By L. A. Fritze. 1,300 words. Canadian Engineer, July 22. 15 cts.

Effect of Filtration and Sterilization on Typhoid Fever in Philadelphia. By Francis D. West, chemist in charge. 2 ills., 1,000 words. Municipal Journal, July 22. 10 cts.

Standpipes and Reservoirs.

Appearance Considered in German Water Towers. Weight given to architectural features of reinforced concrete tanks: circular or octagonal supporting structures used. 2 ills., 800 words. Engineering Record, July 10. 10 cts.

Notes on the Design, Construction and Durability of Reinforced Concrete Standpipes. 4,500 words. Engineering and Contracting, July 21. 10 cts.

Construction Methods Used in Building Parkersburg Reservoir. Holes for blasts were put down with augers; concrete carried to place in light cars running on top of narrow wall. 2 ills. By L. E. Chapin. Engineering Record, July 31. 10 cts.

Design of Reinforced Concrete Reservoirs. From an address by E. R. Matthews, Professor of Engineering, University of London. 2,500 words. Contract Record, July 21. 15 cts.

Reinforced Concrete Standpipes. Description of several pipes in the U. S. and Canada and paper before New England Water Works Association. 5,000 words. Canadian Engineer, July 29. 15 cts.

Concrete Standpipes. Information concerning more than forty erected in the United States; their advantages and disadvantages; causes of leaks and methods of preventing them; experiences of engineers, contractors and superintendents. 5 ills., 4,000 words. Municipal Journal, July 22. 10 cts.

Pumping.

Pneumatic Pumping as Applied to Municipal Water Plants. By John Oliphant. 1,200 words. Fire and Water Engineering, July 21. 10 cts.

Meters.

Privately-Owned Versus Publicly-Owned Water Meters. Extracts from discussions at American Water Works Convention. 1,200 words. American City, July. 25 cts.

Comparative Cost Estimate of Water Waste Prevention by Individual Meters and by District Meters. 1,400 words. Engineering and Contracting, July 14. 10 cts.

Financial.

Valuation of Water Works Properties. The third in a series of articles. This one covers appraisal of overhead costs. By H. P. Gillette, Editor-in-Chief. 8,500 words. Engineering and Contracting, July 7. 10 cts.

Accounting Systems for Municipal Water Works. Gives outline of system and heads under which expenditures and receipts may be classified. By C. C. Clothier, commissioner of public utilities, Guthrie, Okla. 1,500 words. Fire and Water Engineering, July 7. 10 cts.

Miscellaneous.

Locating Ground Water Supplies. Design, construction and cost of their development. From a paper by William S. Johnson before Boston Society of Civil Engineers. 1 ill., 4,000 words. Engineering and Contracting, July 14. 10 cts.

Constructing New Water Intake Tunnel at Milwaukee. Describes construction work, methods of tunnel excavation and describes difficulties encountered. By George F. Staal and L. G. Warren. 2 ills., 6,000 words. Fire and Water Engineering, July 14. 10 cts.

The Choice of Alloys for Water Works Design. Forms and characteristics of non-corrosive metallic alloys used in the design of water works equipment. By Horace Carpenter. 4,000 words. Canadian Engineer, July 22. 15 cts.

STREET LIGHTING AND POWER Lighting.

Pendant Arc Lamps in Charleston. 4 ills., 800 words. Municipal Journal, July 22. 10 cts.

Ornamental Street Lighting. Importance of good lighting; selection and arrangement of lighting unit; cost. From bulletin by Technical Service Bureau, Ames. 4 ills., 1,200 words. American Municipalities, August. 25 cts.

Ornamental Street Lighting Systems Compared. Relative advantages of the single unit and the cluster analyzed from the architectural and the engineering viewpoint. By H. E. Mahan and H. E. Butler. 4 ills., 1,200 words. Electrical World, July 24. 10 cts.

Street Lighting at Sheboygan, Wis. Substitution of Mazda lamps for old type arcs has been satisfactory in that it produced more light and cut down expenses. A good inspection system guarantees prompt replacement of burnt-out lamps. By C. H. Shaw. 4 ills., 1,700 words. Lighting Journal, July. 10 cts.

Comparison of Electric Light and Power Rates. The rates for different classes of service from residence lighting to the wholesale consumer for representative American cities are compared by means of charts. By J. C. Dickerman, chief Bureau of Gas, Philadelphia. 12 charts, 5,000 words. Power, July 6. 15 cts.

(2) screens, a two-story sedimentation tank, a dosing tank and intermittent sand filters; (3) a septic tank, dosing tank and subsurface irrigation or land absorption. By R. F. McDowell. 1,600 words. Engineering News, July 8. 15 cts.

Activated Sludge Tests at Milwaukee. Tests of this new process in two glass tubes, two small tanks and one large tank are described; the design of a continuous flow tank recently put into operation is shown; results to date are summarized. By T. Chalkley Hatton. 2 ills., 3,000 words. Engineering News, July 8. 15 cts.

Activated Sludge Experiments. Description of experimental plant at Regina with reference also to other plants at Chicago, Urbana, etc. By R. O. Wynne-Roberts. 1 ill., 1,200 words. Canadian Engineer, July 1. 15 cts.

Activated Sludge in America: An Editorial Survey. Notes on a new process of sewage treatment, in which air is forced through sewage in a tank which contains an accumulation of aerated bacteria-laden sludge; the effluent is quick settling and stable; the sludge dries readily and may prove to have large fertilizing value. By M. N. Baker, Editor. Engineering News, July 22. 15 cts.

Clarifying Sewage by Fine Screens. Possibilities as compared with tank treatment; definitions and illustrations of various types of screens; band and wing screens. 2 ills., 3,000 words. Municipal Journal, July 29. 10 cts.

Sewage Disposal Plant for Akron. Imhoff tanks, sprinkling filters, secondary sedimentation tanks and sludge beds; also a garbage reduction plant; novel features in detail of Imhoff tank construction and in control chambers. 9 ills., 2,100 words. Municipal Journal, July 15. 10 cts. Appliances and methods used in construction; garbage reduction plant. 2,200 words. Municipal Journal, July 22.

7,000-Foot Pipe Line Floated to Place in Lake Ontario in Long Sections. 76-inch line carrying the effluents from Rochester's disposal plant terminates in large timber crib; line lowered and placed from pile bucks and connected with special submarine joints. By N. A. Brown, assistant engineer. 3 ills., 1,000 words. Engineering Record, July 3. 10 cts.

Sewers.

Design and Construction of the Arroyo De La Brea Sewer System, Los Angeles. 3 ills., 1,000 words. Engineering and Contracting, July 7. 10 cts.

Laying of Sewer Pipe. Notes on the preparation of trenches and foundations, laying of pipe and backfilling of trenches. Recommendations of pipe committee of American Society for Testing Materials. 3,000 words. Canadian Engineer, July 1. 15 cts.

Building a Sewer Tunnel of Special Concrete Blocks, Reinforced. Special blocks bound around with steel bands were used. 4 ills., 1,000 words. Engineering News, July 15. 15 cts.

Beat Scheduled Time Five Months in Building Huge De La Brea Sewer. How Los Angeles built the largest and most expensive storm drain in the west; inspectors' records showing rapidity with which work was carried out. 3 ills., 1,800 words. Engineering Record, July 31. 10 cts.

Sewage Lifting.

Test of a Shone Ejector Plant. Details of methods employed and results of tests made of efficiency of compressor, air main and ejector of operating plant. From an article by C. S. Moore, in Cornell Civil Engineer. 1 ill., 1,700 words. Municipal Journal, July 15. 10 cts.

Miscellaneous.

Design Feature of New Sewerage System and Sewage Disposal Works for Cleburne, Texas. Gives thorough and technical description of present sewerage work and new sewerage system. By R. E. McDonnell, consulting engineer. 14 ills., 1,500 words. Engineering and Contracting, July 28. 10 cts.

Progress in Sanitary Engineering. By Joseph Race, city bacteriologist and chemist, Ottawa. 1 ill., 3,500 words. Contract Record, July 28. 15 cts.

Pollution of Rivers. Studies of the conditions of the Delaware and Schuylkill rivers at Philadelphia; stream velocity and sewage pollution. 1 ill., 1,200 words. Municipal Journal, July 15. 10 cts.

Concrete Lining Improves Sewage-Laden Creek. Self-cleaning invert placed in Harrisburg stream abates nuisance in business district. By J. D. Justin, principal engineer. 2 ills., 2,000 words. Engineering Record, July 24. 10 cts.

Cooperation Plus Hard Works Equals a White Way. How a white way was installed in Corning, N. Y. By H. E. Bodine. 2 ills., 1,000 words. The American City, July. 25 cts.

Power Plants.

New Chittenden Plant of Pittsford Power Company. Highest head plant in the East; 3,700 h.p. developed; 2.25 miles wood pipe line; construction methods. By Thomas Fraher. 5 ills., 2,100 words. Engineering News, July 1. 15 cts.

Hydraulic Redevelopment at Turners Falls, Mass. Notes on design and construction of dams, gates, canal, pond, power house and log haul, replacing a century-old canal development. By H. M. Turner. 8 ills., 3,300 words. Engineering News, July 29. 15 cts.

Lowellville, Ohio, Turbine Plant. Description of 15,000 kw. plant with water tube boilers equipped with underfeed stokers. By Warren C. Rogers. 10 ills., 3,000 words. Power, August 3. 5 cts.

Transmission Line Towers: Foundation and Erection. Review of the practice of several companies. 1 ills., 2,400 words. Engineering News, July 22. 15 cts.

Power Development at Iroquois Falls, Ont. Construction features of new plant. 12 ills., 4,000 words. Canadian Engineer, July 1. 15 cts.

Constructing a Concrete Municipal Dam at Cedar Rapids, Iowa. Describes method of construction and equipment. By Charles E. Stivers. 5 ills., 2,000 words. The Contractor, August 1. 20 cts.

FIRE.

Apparatus.

Motor Fire Apparatus. Cars should be specially designed and built; historical sketch of automobile fire apparatus; specifications; types of pumps; chemical apparatus; acceptance tests. By J. A. Anglada. 3,000 words. Fireman's Herald, July 10. 5 cts.

Motor Apparatus in Cities of Less than 10,000 Inhabitants. Considers arguments for and against motor apparatus and gives some costs of operation. By W. T. Craswell. 1,200 words. Fire and Water Engineering, July 28. 10 cts.

English Motor Fire Engines. Short description of some of the types now in use in England. 4 ills., 1,800 words. Municipal Engineering, July. 25 cts.

Motor Driven Fire Apparatus. The seventeenth in a series of articles by Victor W. Page. This one discusses pumping apparatus. 6 ills., 2,500 words. Fire and Water Engineering, July 21. 10 cts.

Protection.

Pittsburgh's Fire Protection. Discusses organization of department, water system and fire alarm. From report of National Board of Fire Underwriters. 3,000 words. Fireman's Herald, July 24. 5 cts.

Report on Fire Service in Pittsburgh. Report of National Board of Fire Underwriters. 4,000 words. Fire and Water Engineering, July 28. 10 cts.

STREET CLEANING AND REFUSE DISPOSAL.

Street Cleaning.

Horse Traction in Relation to Street Cleaning. Discusses advantages of motor and horse traction in street cleaning, refuse collection and clinker removal. By W. H. Hamblett, cleansing superintendent, Salford. 1,200 words. The Surveyor, July 9. 40 cts.

New Type of Pick-up Street Sweepers. Record of service of Merritt Pick-up sweeper on New York streets. 1 ills., 900 words. Engineering News, July 29. 15 cts.

Philadelphia Street Cleaning by Contract. Abstract of important specifications clauses which have resulted in highly efficient work. 1,400 words. Engineering News, July 1. 15 cts.

Refuse Collection.

Garbage Collection Studies in Chicago Justify Continued Use of Horses. Data assembled for gasoline and electric trucks warrant their adoption only for hauling after horse-drawn carts have done the collecting. 1 ills., 2,000 words. Engineering Record, July 10. 10 cts.

Refuse Disposal.

Destructors and Their By-Products. Extracts from paper by J. A. Priestley, cleansing superintendent, Sheffield. 2,500 words. The Surveyor, July 9. 40 cts.

Reduction of New York's Garbage. Largest garbage reduction plant in the world: digesters, presses, dryers and percolators; condensers, scrubbers and other devices for preventing odors; ex-

pert's report on further elimination of them. 7 ills., 2,500 words. Municipal Journal, July 8. 10 cts.

Seattle's Refuse Destructors. Reasons for discontinuing one of them in favor of dumping on tidal flats; importance of collection. 1,500 words. Municipal Journal, July 8. 10 cts.

New Methods of Odor Elimination at Garbage Plants Indicated by New York Tests. Furnace heat alone is not a deodorizer of insoluble digester gases; final washing necessary. 3,000 words. Engineering Record, July 3. 10 cts.

TRAFFIC AND TRANSPORTATION.

Electric Hoists of Hamilton Inclined Railway. New equipment for passenger incline of 40.2 per cent grade with maximum carloads of 30,000 lbs. 2 ills., 1,000 words. Engineering News, July 8. 15 cts.

Hamilton Incline Railway. Passengers and trams carried up a 40 per cent grade; details of electric hoist. 3 ills., 2,000 words. Municipal Journal, July 8. 10 cts.

Novel Type of Motor Omnibus. Chair car omnibus operates between St. Paul and Minneapolis. 1 ills., 700 words. Engineering News, July 8. 15 cts.

Motor Trucks for Heavy Structural Steel. New York City experience and cost data. By William Collins, Jr. 2 ills., 1,000 words. Engineering News, July 22. 15 cts.

Progress of Construction on the New Welland Ship Canal. Description of method of construction. By J. L. Weller, chief engineer. 1,500 words. Contract Record, August 4. 15 cts.

A Discussion of Mechanical Traction for Municipal Work. Compares steam-driven, gasoline-driven and electric vehicles. By E. J. Elford. 1,500 words. Contract Record, August 4. 14 cts.

STRUCTURAL MATERIALS.

Useful Facts About Materials. Abstracts of papers presented at annual meeting of American Society for Testing Materials. 2,400 words. Engineering News, July 15. 15 cts.

Useful Facts About Materials. Abstracts of papers presented to annual meeting of American Society for Testing Materials. 3,600 words. Engineering News, July 8. 15 cts.

Tests of Frictional Resistance of Concrete on Shale. Experiments to determine friction angle of concrete blocks on shale, shale blocks on shale and concrete cast on shale. E. L. Lasler. 5 ills., 1,900 words. Engineering News, July 22. 15 cts.

Concrete Tests. Outline of work in progress under direction of committee of American Society for Testing Materials. 1,400 words. Engineering and Contracting, July 14. 10 cts.

Hydrated Lime and Ordinary Lime. Describes hydrated lime; methods of manufacture; strength of mortar. By E. W. Lazell, chemical engineer, Portland, Ore. 2,000 words. Contract Record, July 28. 15 cts.

Annual Meeting of the American Society for Testing Materials. Abstracts of papers and committee reports. 2,000 words. Engineering News, July 1. 15 cts.

BRIDGES.

Construction Methods on Unusual Bridge in Houston, Tex. Triangular reinforced concrete structure joins three streets and was built in two sections. 2 ills., 4,000 words. The Contractor, August 1. 20 cts.

Deep Bridge Piers Sunk Without Air. Well method of sinking deep piers by Delaware, Lackawanna and Western R. R. at Buffalo, N. Y. 6 ills., 3,000 words. Engineering News, July 8. 15 cts.

Long-Span, Continuous-Truss Bridge Over Ohio River at Scottdale. Two spans of 775 ft. continuous over the center pier; trusses have Warren web; enormous gussets; floor-beams have wings extending up to swaybracing, forming rigid frames, for economy and stiffness with shallow floor; steel harder than normal. 2 ills., 2,200 words. Engineering News, July 8. 15 cts.

New Methods Evolved in Building World's Largest Bridge. Method of erection of members spliced between panel points; travelers unique for size and central operating control. 14 ills., 2,500 words. Engineering Record, July 24. 10 cts.

Design, Construction and Detailed Costs of Reinforced Concrete Girder Bridge Over Red Cedar River, Mich. 8 ills., 3,500 words. Engineering and Contracting, July 21. 10 cts.

Methods and Equipment Used in Constructing the Superstructure of the Detroit-Superior High Level Bridge. Describes concrete plant and method of concreting, forms and centering. 6 ills., 3,500 words. Engineering and Contracting, July 7. 10 cts.

Special Pier and Floor Design Feature Pacific Highway Interstate Bridge. Discusses loads and impact allowance; curved I-beams used in floor. 4 ills., 3,000 words. Engineering Record, July 3. 10 cts.

The Georgia-Harris Viaduct, Vancouver. General description of longest reinforced girder span in the world. 1 ills., 750 words. Contract Record, July 28. 15 cts.

MISCELLANEOUS.

Illinois Law Requires Licenses for Engineers. Western Society of Engineers prepared act lately passed by legislature. 1,500 words. Engineering Record, July 17. 10 cts.

New Features in Surveying Instruments. Recent developments in surveying instrument is toward greater strength and rigidity; to illustrate this development a line of instruments emphasizing these features is described. 11 ills., 1,200 words. Engineering News, July 29. 15 cts.

Fundamental Principles of Scientific Shoveling. Discussion of loads for shovel and the methods of handling shovels. The third of a series of articles by Daniel J. Hauer. 2 ills., 2,500 words. The Contractor, August 1. 20 cts.

Chicago Municipal Pier. Description of a pier for freight and passenger steamers. Accommodations for recreation space and auditorium. Criticisms on design and construction. 6 ills., 3,600 words. Engineering News, July 29. 15 cts.

Rational Method of Calculating Depreciation Values. By H. P. Gillette, Editor-in-Chief. 7,500 words. Engineering and Contracting, July 14. 10 cts.

Some Notes on Cost-Keeping. Defines cost and gives advantages and uses of cost-keeping system; installing system. By Edward Probert. 6,000 words. Engineering Contractor, June. 25 cts.

City Planning Restrictions on Private Property. Second installment: Public utilities, building regulation, structural requirement, unity in planning and effect of planning on land values. By Frank B. Williams. 5,000 words. American City, July. 25 cts.

Municipal Control of Street Planning. Control of subdivision of outlying districts by municipal and state authorities; abstracts of laws of cities, states and Canadian provinces. By Andrew Linn Bostwick. 4,000 words. Municipal Journal, July 29. 10 cts.

Portland Street Corner Directories. Give detailed information concerning places of importance and interest. 1,000 words. Municipal Journal, July 1. 10 cts.

Reducing Smoke in Pittsburgh. Pittsburgh has recently made several changes in its smoke ordinances and during the last year has accomplished commendable results in smoke abatement. By J. W. Henderson, chief, Bureau of Smoke Regulations. 6 ills., 1,500 words. Power, August 3. 5 cts.

PUBLICATIONS RECEIVED

The Correctional System of Springfield, Ill. By Zenas L. Potter. 177 pp. Public Health in Springfield, Ill. By Franz Schneider, Jr. 146 pp. The Springfield Survey, Department of Surveys and Exhibits, Russell Sage Foundation, New York. Price 25 cents each. (To be reviewed later.)

American Society of Municipal Improvements. Proceedings, 1914 Convention. 824 pp. Secretary, Charles Carroll Brown, 702 Wulsin Bldg., Indianapolis, Ind.

Forestry in Relation to City Building. By T. P. Lukens. 34 pp. Throop College of Technology, Pasadena, Cal.

Shrinkage and Time Effects in Reinforced Concrete. By Franklin R. McMillan. 41 pp. Studies in Engineering, No. 3, University of Minnesota, Minneapolis, Minn.

NEWS OF THE SOCIETIES

Calendar of Meetings.

August 11-13.
AMERICAN STATISTICAL ASSOCIATION.—San Francisco, Cal. Secretary, Prof. C. W. Doten, Massachusetts Institute of Technology, Boston, Mass.

August 11-14.
AMERICAN ECONOMIC ASSOCIATION.—San Francisco, Cal. Secretary, A. A. Young, Ithaca, N. Y.

Aug. 18-19.
CONNECTICUT STATE FIREMEN'S ASSOCIATION.—Annual Convention, New Haven. Secretary, Chief R. V. Magee, Watertown, Conn.

Aug. 18-19.
MONTANA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Lewistown.

Aug. 24-27.
PROVINCIAL ASSOCIATION OF FIRE CHIEFS.—Annual Convention, Ottawa, Ont. Secretary, Chief James Armstrong, Kingston, Ont.

August 24-27.
INTERNATIONAL ASSOCIATION OF MUNICIPAL ELECTRICIANS. Twentieth Annual Convention, Gibson Hotel, Cincinnati, O. Secretary, Clarence R. George, Houston, Tex.

August 24-27.
SECOND NATIONAL CONFERENCE ON UNIVERSITIES AND PUBLIC SERVICE.—Boston, Mass. Secretary, Edward A. Fitzpatrick, Box 380, Madison, Wis.

Aug. 31-Sept. 3
INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS.—Annual Convention, Cincinnati, O.

September 6-13.
INTERNATIONAL HEALTH CONGRESS, to meet with the American Public Health Association, the 15th annual conference of the New York State Health Department and the New York State Sanitary Officers' Association.—Rochester, N. Y.

Sept. 7-9.
NEW ENGLAND WATERWORKS ASSOCIATION.—Annual Convention, New York City. Secretary, Willard Kent, 715 Tremont Temple, Boston, Mass.

Sept. 7-9.
NATIONAL FIREMEN'S ASSOCIATION.—Annual Convention, Rockford, Ill. Secretary, W. F. Gilliooley, Davenport, Ia.

Sept. 13-19.
PAN-AMERICAN ROAD CONGRESS.—Held by American Road Builders' Association and the American Highway Association. Oakland, Cal.

September 16.
PACIFIC HIGHWAY ASSOCIATION.—Annual Convention, San Francisco, Cal. President, Samuel Hill, Maryhill, Wash.

September 16-18.
AMERICAN SOCIETY OF CIVIL ENGINEERS. Convention, San Francisco. Secretary, Charles W. Hunt, 220 West 57th St., New York City.

Sept. 16-18.
AMERICAN ELECTROCHEMICAL SOCIETY.—Twenty-eighth annual general meeting, San Francisco. J. M. Muir, 239 West 39th street, New York City, Chairman of Transportation Committee.

September 16-18.
AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Convention, San Francisco. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

September 16-18.
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Convention, San Francisco. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

September 16-25.
INTERNATIONAL ENGINEERING CONGRESS.—Am. Soc. C. E., Am. Inst. Min. E., Am. Soc. Mech. E., Am. Inst. E. E. and Soc. N. A. & M. E., San Francisco, Cal. Secretary, W. A. Catell, Foxcroft Building, San Francisco, Cal.

September 20-23.
ILLUMINATING ENGINEERING SOCIETY.—Ninth annual convention, New Willard Hotel, Washington, D. C. Secretary C. A. Littlefield, 29 West 39th Street New York.

Sept. 22-24.
MASSACHUSETTS STATE FIREMEN'S ASSOCIATION.—Annual convention, Haverhill, Mass. George Wilson, Lynn, Mass., Chairman of Committee.

September 27-30.
SAFETY CONFERENCE. San Francisco.

Sept. 27-Oct. 1.
PACIFIC COAST FIRE CHIEFS' ASSOCIATION.—Annual Convention, San Francisco. Secretary, Harry W. Bringham, Fire Marshal, Seattle, Wash.

September 27-October 1.
INTERNATIONAL GAS CONGRESS AND AMERICAN GAS INSTITUTE. Convention, San Francisco. Secretary, George C. Ramsdell, 29 West 39th St., New York City.

Sept. 29-Oct. 1.
MASSACHUSETTS STATE FIREMEN'S ASSOCIATION.—Thirty-sixth Annual Convention, Haverhill. Secretary, D. Arthur Burt, Taunton.

October 4-9.
AMERICAN ELECTRIC RAILWAY ASSOCIATION. Convention, San Francisco. Secretary, E. B. Burritt, 8 West 40th St., New York City.

Oct. 5-8.
PENNSYLVANIA STATE FIREMEN'S ASSOCIATION.—Annual Convention, Philadelphia. President, Miles S. Humphreys, Pittsburgh, Pa.

Oct. 11-15.
NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION.—Annual Convention, Dayton, O. Secretary, Will P. Blair, B. of L. E. Bldg., Cleveland, O.

October 12-15.
AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Annual Convention, Dayton, O. Secretary, Charles Carroll Brown, 702 Wulsin Bldg., Indianapolis, Ind.

November 17-19.
NATIONAL MUNICIPAL LEAGUE.—Annual Convention, Dayton, O. Secretary, Clinton Rogers Woodruff, 705 North American Bldg., Philadelphia, Pa.

Dec. 27-Jan. 8, 1916.
SECOND PAN-AMERICAN SCIENTIFIC CONGRESS.—Washington, D. C., Department of State, Washington.

February 15-18, 1916.
SECOND NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Secretary, J. P. Beck, 208 S. LaSalle St., Chicago, Ill.

Pan-American Road Congress.

The advance program of the Pan-American Road Congress outlines the work to be followed at the ten sessions, which will be held at the Municipal Auditorium, Oakland, Cal., from the morning of Monday, September 13, until the afternoon of Friday, September 17.

The first session, Monday morning, will be taken up by the opening exercises. The opening address will be by Governor Gates, of Vermont, Chairman of the Executive Committee; addresses of welcome will be made by Governor Johnson of California, Mayor Davis of Oakland, and Director of Congresses Barr of the Panama Pacific Exposition. Responses will be made by President Tillson of the American Road Builders' Association, and President Harrison of the American Highway Association.

Six educational addresses are scheduled for Monday afternoon. Both morning and afternoon sessions on Tuesday, Wednesday and Thursday, and that of Friday forenoon, will be devoted to the presentation and discussion of papers for bringing out the latest and most approved ideas in road and street construction and maintenance. Friday afternoon will be given to committee reports, business and resolutions.

Chairman Gates will be assisted by the following-named persons, who will preside at various sessions of the Congress: Fairfax Harrison, President A. H. A.; George W. Tillson, President A. R. B. A.; Captain Walter Coggeshall, President Tri-State G. R. A.; W. A. McLean, Chief Engineer Ontario Highways; Judge W. S. Worden,

Treasurer Tri-State G. R. A.; James H. MacDonald, of Connecticut, and W. D. Sohler, Chairman, Mass. Highway Com.

The program schedules twenty-one papers open to discussion. They have been prepared and the discussions will be led by men well known in road building circles and the committee has endeavored, so far as possible, to assign to each the subject which is within the scope of his greatest activity. In this way the most complete information may be brought out. After the paper on any subject has been presented and the discussion opened by the person selected, remarks will be in order by anyone interested in the subject.

Acceptance of the subjects assigned by the Program Committee have already been received from about forty of those designated, and others are constantly being received. These acceptances cover practically all phases of road and street construction, maintenance and administration.

Many special local representations of the congress have been and are being appointed in different sections of the country. These representatives will supply information to all inquirers concerning details.

A special official train has been arranged, under the direction of J. Edward Eager & Co., of Baltimore, Md., which will leave Chicago, September 2, and arrive at Oakland September 12. The train will go over the C. & N. W. Railway at St. Paul, over the "Soo" line to the Canadian border and then over the Canadian Pacific, through the Canadian Rockies to Vancouver, and to Seattle. The trip thence to Oakland will be over the Northern Pacific and Southern Pacific railroads. Stops will be made for visiting points of interest throughout the entire trip.

Among the acceptances already received from those designated by the Committee on Program are the following:

S. E. Bradt, Secretary, Illinois Highway Commission; H. E. Breed, First Deputy State Highway Commission, N. Y.; Lamar Cobb, State Engineer, Arizona; G. P. Coleman, State Highway Commissioner, Virginia; W. H. Connell, Chief, Highway Bureau, Philadelphia; Geo. W. Cooley, State Highway Engineer, Minnesota; A. W. Dean, Chief Engineer, Massachusetts Highway Commission; Henry Welles Durham, formerly Highway Engr., Bor. of Manhattan; A. B. Fletcher, State Highway Engineer, California; W. S. Gearhart, State Highway Engineer, Kansas; S. D. Gilbert, Auditor, State Highway Commission, N. Y.; Henry S. Graves, Chief, T. S. Bureau of Forestry; Fairfax Harrison, President A. H. A., Washington, D. C.; Curtis Hill, City Engineer, Kansas City, Mo.; Prevost Hubbard, U. S. Department of Agriculture; A. N. Johnson, Bureau of Municipal Research, New York City; H. J. Kuelling, County Highway Commissioner, Milwaukee, Wis.; N. P. Lewis, Chief Engineer, Board of Estimate and App't., N. Y. C.; James H.

MacDonald, formerly Highway Commissioner of Conn.; T. W. MacDonald, State Highway Engineer, Iowa; W. A. McLean, Chief Engineer, Ontario Highway Commission; E. R. Morgan, State Road Engineer, Utah; M. M. O'Shaughnessy, City Engineer, San Francisco; L. W. Page, Director U. S. Office of Public Roads; Dr. J. H. Pratt, State Geologist, North Carolina; F. F. Rogers, State Highway Commissioner, Michigan; William R. Roy, State Highway Commissioner, Washington State; Paul D. Sargent, Chief Engineer, Maine Highway Commission; Prof. L. S. Smith, University of Wisconsin; W. D. Sohler, Chairman Massachusetts Highway Commission; Col. E. A. Stevens, State Commissioner of Public Roads, New Jersey; George W. Tillson, President A. R. B. A., Borough of Brooklyn, N. Y.; W. D. Uhler, Chief Engineer Pennsylvania Highway Department; A. D. Williams, Chief Road Engineer, West Virginia; J. F. Witt, County Engineer, Dallas, Texas.

Second National Conference on Concrete Road Building.

The organization of sub-committees for the Second National Conference on Concrete Road Building, to be held in Chicago, Feb. 15, 16, 17 and 18, 1916, has been completed. Seventeen committees have been named, each to investigate and submit a report upon a specific topic in connection with the construction of concrete roads. The committees are made of college and university professors, state, city and county authorities, engineers and contractors. The committees are as follows:

- 1—Drainage and Preparation of Subgrade.
- 2—Economical Widths of Pavement and Shoulders.
- 3—Problems of Design, Thickness, Crown and Grade.
- 4—Aggregates.
- 5—Handling and Hauling Materials and Water Supply.
- 6—Organization of Concreting Crew.
- 7—Proportions of Materials and Consistency of Concrete.
- 8—Mixing and Placing Concrete.
- 9—Reinforcing.
- 10—Joint Location and Construction.
- 11—Expansion and Contraction.
- 12—Finishing and Curing.
- 13—Construction of Shoulders and Curbs.
- 14—Methods and Cost of Maintenance.
- 15—Form of Specifications.
- 16—Cost of Construction.
- 17—Estimating and Inspection Problems.

The Advisory Committee has again elected Dr. W. F. M. Goss, Dean of the College of Engineering of the University of Illinois as chairman, and J. P. Beck as secretary.

In the preliminary announcement of the next conference appears the following paragraphs:

"The First Conference held in Chicago in February, 1914, proved an unqualified success and by resolution the Advisory Committee was empowered

to make arrangements for a future conference. Many matters came before the first conference for the consideration of which further investigation and study was considered advisable. The large attendance and deep interest manifested at the sessions emphasize the need for such further deliberations as will be brought out by the conference in February, 1916. During the period intervening between the two meetings, new sources of information have been opened and a new fund of engineering experience will be available. The rapid extension of the use of concrete for the construction of roads, street pavements and alleys, which occurred prior to 1914, has been even more marked during the year succeeding the first conference and indications point to a continued expansion in the adaptation of concrete to road construction * * *.

"The program for the second conference will follow the general lines worked out so successfully for the first meeting with a few changes dictated by new conditions.

"A few copies of the printed proceedings of the first conference may be had by interested parties, free of charge, upon application to the secretary.

"A cordial invitation is extended to all interested in highway improvements to correspond with the secretary and to attend and participate in the conference."

The secretary's office is at 208 South La Salle street, Chicago.

Arizona Good Roads Association.

The officials of the Arizona Good Roads Association have decided that the next conference of the association shall be held at Flagstaff at a date after the middle of September.

It was originally planned to hold a meeting about the time of the Tax Conference, but the Tax gathering does not close until the last day of July, and so many men must be back at their business places on the first of the month that it was decided, with a view to getting together a big meeting to hold the road session at a later date when more of the people are back from vacations.

The president of the association, Dwight B. Heard, is preparing the call which will be issued in a few days.

Florida Good Roads Association.

The board of governors of the State Good Roads Association held a meeting in St. Augustine in the chamber of commerce hall. Chairman A. W. Corbett of the board of governors presided.

Resolutions were adopted expressing gratification at the good work on behalf of better roads that has been accomplished by the various highway associations recently organized in Florida.

While a purely local matter it was thought well to use the influence of the organization in inducing the commissioners of Duval County to make temporary improvements of the missing link of four miles in the John Anderson highway between Jacksonville and St. Augustine, just north of

the St. John's county line. A special committee composed of Mrs. Brownell, H. G. Aird and J. H. Williams was named to wait upon the board as soon as possible and see what can be done.

President Miller announced the following committees: Legislative, Judge H. B. Philips, Jacksonville; membership, Frank J. Parker of St. Augustine; finance, Dr. W. M. Stinson of Jacksonville; ways and means, Major A. B. Small of Lake City. Committee of arrangements for the next annual convention to be held in St. Augustine in March, 1916, consists of the good roads committee of the St. Augustine Chamber of Commerce.

PERSONALS

Members of the new Alabama state highway commission were sworn into office by John Moffat, recording secretary to the governor. R. E. Spraggins of Huntsville, is chairman of the new commission, and his associates are J. B. Rylance of Dadeville, and Capt. John Craft of Mobile. Mr. Rylance succeeds Julian Smith of Selma. Other members of the commission are Dr. Eugene A. Smith of Tuscaloosa, and Prof. George N. Mitcham of Auburn, who hold their positions by virtue of their connection with the state engineering schools.

Baker, John, has been appointed chief of police of Milford, Del., succeeding Charles Macklin, resigned.

Carlisle, John N., former highway commissioner of New York state, has resigned his place in the highway department in which, after being succeeded by Commissioner Duffey, he had acted in an advisory capacity.

William C. De Hart and Norton L. Wilson, members of the Elizabeth, N. J., board of police commissioners, have resigned.

Deweese, William C., has been named by Mayor George Lippincott chief of the Fire Department of Collingswood, N. J., to succeed the late Harry S. Woods.

Frissell, Richard, has been elected city clerk of Cape Girardeau, Mo.

Gannett, Farley, who has resigned his position as engineer on the Water Supply Commission of Pennsylvania, has opened an office in the Telegraph Bldg., Harrisburg, Pa., for the practice of engineering, associated with Theodore E. Seelye, formerly division engineer of the commission.

McCarthy, Patrick D., has been appointed park commissioner of Syracuse, N. Y., succeeding Morgan A. Dunne.

Murray, J. J., state senator, of Marshall county, Tennessee, has been elected secretary of the State Highway Commission.

Park, W. A., of Knoxville, Tenn., has been chosen consulting engineer for road work in Claiborne county, Tenn.

Scovel, Henry S., has been appointed by Governor Fielder to succeed Harry R. Humphreys as member of the State Water Supply Commission of New Jersey. The salary is \$2,500.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

THE "BULL" TRACTOR.

A 20-H.P. Machine for Road and Similar Work.

The "Big Bull" tractor is a light three-wheel tractor with a weight of less than 4,500 pounds and a speed, not allowing for slip, of 2.6 miles per hour. It may be used for hauling road machinery, as in grading, or materials. Special features claimed for the Bull include a patent leveling device by which the tractor is easily and quickly adjusted to side hills or deep furrows. It has a direct drive with only four gears, all complicated transmission and compensating gears being eliminated. The tractor has a special gear-shifting device, an extra large crank shaft and connecting rod bearings and an extra large inspection plate on top of the motor, affording easy examination of bearings without disturbing timing.

The motor is of the horizontal two-cylinder opposed type, ell-head, cast solid, producing a maximum horsepower at belt, 25 and guaranteed 20, and at drawbar 10, guaranteed 7. The cooling is by water, forced circulation by centrifugal pump. Lubrication is by means of a standard, six-feed Detroit force feed oiler of large capacity, which is always under control. The carburetor is a standard model, and ignition is by a low tension magneto, shaft driven, with flexible coupling, mounted on top, or the Levison battery ignition system. The connecting rods and crank shaft are drop-forged, carbon steel, double heat treated. The crank case is of novel design and construction and insures ready accessibility to all parts of the engine.

The drive wheel is 5 feet in diameter

and 12 inches wide and is equipped regularly with cone lugs. The front wheel is 2 feet 8 inches and is mounted on a fork of bicycle construction. The hand wheel is 3 feet 4 inches in diameter and may be raised or lowered positively in leveling. The steering is by an irreversible worm and gear arrangement. The frame is of heavy rolled steel channels, braced in front, and of strong construction. The clutch is of the contracting band type, adjusted at one point, and the friction surface is Raybestos. The wheelbase is 107 inches, and the over all dimensions are: Length, 13 feet 11 inches; width, 3 feet 11 inches, and height, 6 feet 3 inches.

The "Little Bull" is of the same general design but weighs 3,280 pounds and has a guaranteed horsepower of 5 at the drawbar and 12 at the belt.

The illustrations show the "Big Bull" itself and an action photograph of the tractor. These tractors are made by the Bull Tractor Co., 27th and University Aves., S. E., Minneapolis, Minn.

THE HYDRO-CHRONOGRAPH.

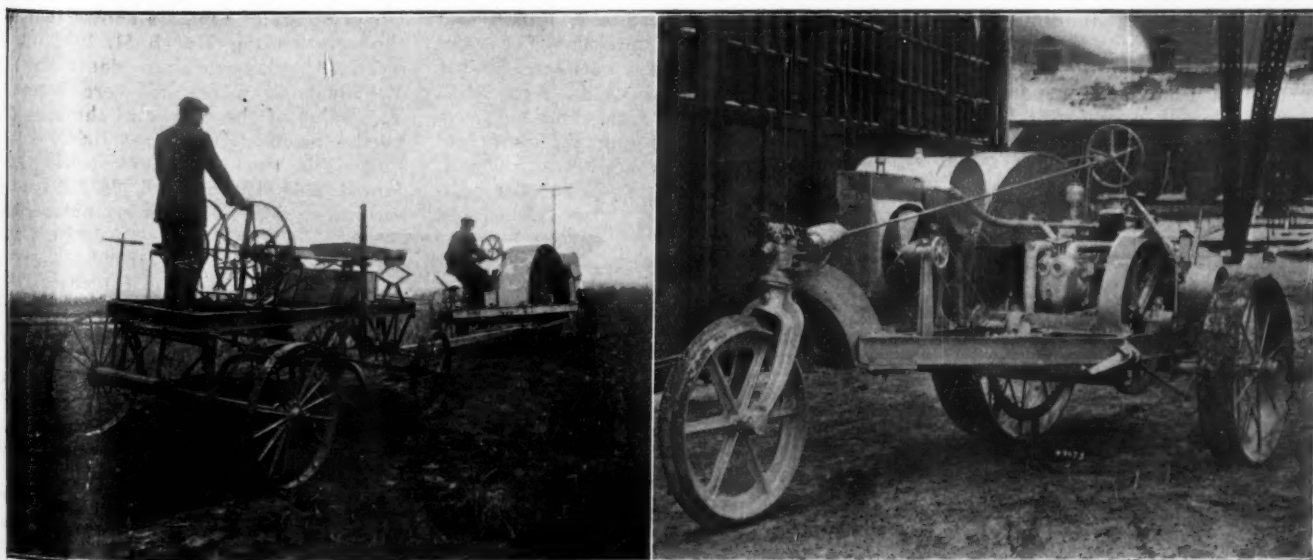
For Recording Water Levels.

The Hydro-Chronograph was designed to meet the demand for an accurate and reliable water level recording gauge at a moderate price and embodies some features new in the construction of such devices. A very large drum is used, set vertically and balanced so that it will revolve at a touch. The drums on all instruments except the type B-1 and the "gate recorder" are 24 inches in circumference by 15½ inches high, giving a distinct and accurate record. The rectangular charts with the divisions regular for all heights of water and

periods of time make possible the use of a planimeter.

The drum is rotated by clockwork, the recording mechanism being operated by a float and counterweight. The number of working parts has been reduced to a minimum to avoid unnecessary friction. The worm and bevel gearing is accurately cut and fitted to eliminate lost motion and consequent error. With the exception of a few parts of the clock mechanism, the instrument is all of brass construction and cannot rust or corrode, and the only part exposed to the water is the copper float.

Originally the hydro-chronograph was made for a monthly record and intended principally for stream gauging at isolated points. Now the instrument is made in a variety of types for a wide range of purposes. There is a weekly record instrument, a duplex instrument for recording head and tail water levels simultaneously and a gate gauge for recording amount of turbine gate opening. The combination of a duplex instrument with a gate recorder will tabulate accurately for a water power plant the head elevation, tail elevation, effective head, percentage of gate opening and exact amount of power used at any given time, or by means of a planimeter, the averages for any elapsed time interval may be found. The standard single record instrument for use at stream gauging stations, reservoirs, water-power plants, filtration basins, etc., is made for ranges of 15 to 30 feet and for 7 and 31-day periods. Types A-234 and B-234, illustrated here, are designed especially for stream gauging work or where the instrument is to be used intermittently at several points.



THE "BULL" TRACTOR AT WORK.

It has three sprocket wheels, 3, 4 and 6 inches in diameter corresponding to 15, 20 and 30 feet maximum level ranges. Type B-1-D can also be used for any two levels, as in a filtration plant. The hydro-chronograph weir gauge, type C-I-W, recording maximum variation of water level of 2 feet without reduction or 4 feet on two to one reduction, is used where variation is within these limits and where great accuracy is required. The long-distance instrument, with electric attachments, can be placed in office or power house and will record variation in level at a point several miles away.

The hydro-chronograph is made by the Hydro Manufacturing Co., Bullitt Building, Philadelphia, Pa.

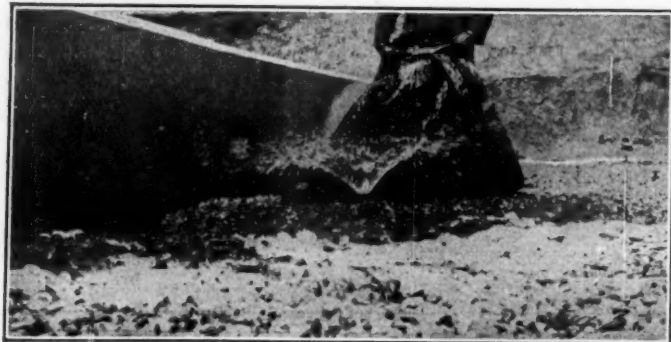
SEWAGE SPRAYING NOZZLE.

Circular Type, Adjusted to Design.

The "Universal" sewage spraying nozzle is designed to be adjusted at the factory for the desired discharge capacity called for in the particular plant design. The result, as shown by tests on spraying nozzle at the Sheffield Scientific School at Yale, is claimed to be greater uniformity of distribution. Similar claims are made for the circular design of the nozzle. The height between the top of the orifice and the bottom of the cone is varied, $\frac{5}{8}$ inch for 9-16 inch orifice and $\frac{1}{2}$ inch for $\frac{3}{4}$ inch orifice.

In addition to uniformity of distribution the principal feature of "Universal" design is calculated to result in freedom from clogging. This, of course, reduces considerably the cost of maintenance by reduction of necessary cleaning, and the necessity of screening between the settling tanks and filter beds is obviated. Internal clogging features are eliminated and any clogging material catching on the arms can be removed without unscrewing any parts, thus avoiding trouble of handling small parts and worn or crossed threads. Cleaning is done with the nozzle in operation, thus saving time and preventing overdose when nozzle or part is removed for passing large particles, which may result in clogging of filter bed around the nozzle.

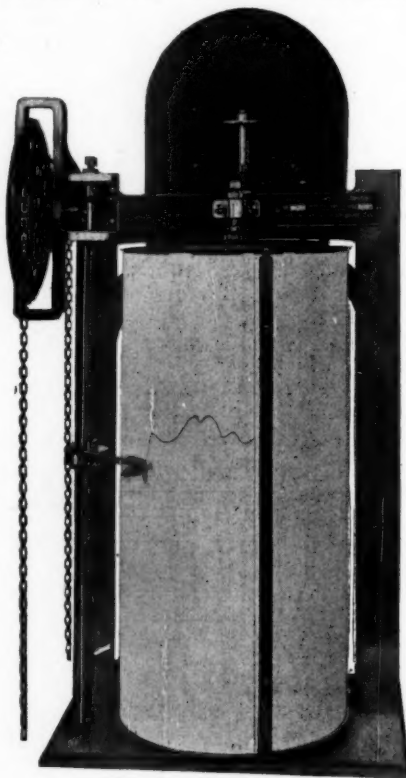
The "Universal" nozzle is made by the Snow & Petrelli Mfg. Co., New Haven, Conn.



"UNIVERSAL" SEWAGE SPRAYING NOZZLE, SHOWING UNIFORM DISTRIBUTION.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—The placing of 1,200 tons of pipe at Kenosha, Wis., has been arranged and the formal award to the leading interest is expected to follow. The only other municipal work of any size involves the placing of 1,500 tons at Cambridge, O. A number of small lettings are reported, including 260 tons at Watertown, S. D., and 350 tons at Coldwater, O. Quotations: 4-inch, \$26; 6 to 12-inch, \$24; 16-inch and up, \$23.50; Class A, \$1 extra. Birmingham—The pipe factories are continuously busy at about 80 per cent capacity, with no accumulations. Recent orders are not heavy.



THE HYDRO-CHRONOGRAPH.

Quotations: 4-inch, \$20.50; 6-inch and up, \$18.50. San Francisco—The only recent order of any consequence is for 300 tons placed by Phoenix, Ariz., with the United States Cast Iron Pipe & Foundry Co. No important municipal inquiries are in the market at present. New York—The most important public letting is that of Perth Amboy, N.

J., on 3,000 tons of various sizes, from 4 to 20-inch, let August 4. Prices are well maintained. Quotations: 6-inch, Class B and heavier, \$23 to \$23.50; Class A, \$24 to \$24.50.

Lead.—Quotations: New York, \$5.00; St. Louis, \$4.90.

The Goodyear Tire & Rubber Co., Akron, O., announces that the State Highway Department of Pennsylvania has awarded a contract to O'Brien & Hoover, of Philadelphia, for Goodyear solid tires for the department trucks, to be supplied for two years, ending June 1, 1917. The tires have a guarantee of 7,000 miles, to be consumed within one year from date of contract.

Clay Products in Canada.—According to Consul Henry P. Starrett, Fort William, Ontario, in the Commerce Reports, during normal times Canada's annual purchases of clay products—brick, tile, and pipe—approximate \$12,000,000. Of this total Canadian manufacturers supply about 75 per cent; the remainder comes largely from the United States. The clay-working industry of Canada has suffered greater depression since the war began than has fallen to the share of any other of its large industries. It is stated on good authority that in the Province of Ontario, which furnishes 50 per cent. of the total Canadian output of clay products, not more than one-third of the existing plants are operating, even on half time. According to the census of 1911 there were 399 brick, tile, and pottery manufacturing establishments in the Dominion. These plants had a total capitalization of \$14,782,226, employed 8,208 men, and the annual value of their combined production was \$8,291,561. While no data are available for the Dominion as a whole, covering the period since 1911, it is known that during 1913 the output of clay wares reached its high-water mark in Canada, most plants having worked to full capacity. A recent report made by the Provincial Government of Ontario shows that for the year ending March 31, 1914, there were 241 clay-working plants in the Province, of which 25 were inactive. The value of the output of these plants in the period given was: Brick—common (kiln run), \$3,283,894; paving and fancy, \$243,119; pressed, \$871,291; and sandlime, \$459,699; sewer pipe, clay, \$600,297; tile, clay drain, \$251,705; tota, \$5,710,005.

During the fiscal years 1910, 1912 and 1914 (year ended March 31) the total imports of paving brick were \$138,763, \$165,650 and \$171,617 respectively. For the same years the imports of drain and sewer pipe and the fittings amounted to \$176,002, \$406,482, \$454,526.

The Canadian customs tariff provides an ad valorem duty on paving brick of 30 per cent. and on drain and sewer pipe of 42½ per cent. when coming from the United States.



ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET AND ROADS				
Ind.	Jeffersonville..10 a.m.	Aug. 14..	Grading, paving and improving road.....	G. W. Stoner, Co. Aud.
Ill.	Woodstock.....1 p.m.	Aug. 14..	Constructing concrete pavements.....	G. W. Frame, Sec. B. L. I.
Ind.	Goshen.....1 p.m.	Aug. 14..	Grading, paving & improving roads, three jobs.....	J. W. Brown, Co. Aud.
Ind.	Greencastle.....2 p.m.	Aug. 14..	Grading, paving and improving roads, two jobs.....	C. L. Airhart, Co. Aud.
Wash.	Tacoma.....11 a.m.	Aug. 14..	Paving 5 miles with first-class pavement.....	T. N. Morris, Co. Aud.
Neb.	Lincoln.....Aug. 14..	Aug. 14..	Pav. with brick & asphaltic conc. to cost \$70,000.....	Arthur Edgren, Co. Engr.
Ky.	Louisville.....Aug. 14..	Aug. 14..	Road construction.....	County Commissioners
O.	Marion.....Noon	Aug. 14..	1,500 cu. yds. excavation and 7,800 yds. macadam.....	Pearl Mears, City Engr.
Neb.	Omaha.....Noon	Aug. 14..	15,000 cubic yards grading.....	F. Dewey, Co. Clk.
N. C.	Newbern.....11 a.m.	Aug. 14..	Resurfacing roadway at National Cemetery.....	J. B. Houston, Depot Q. M., Washington, D. C.
Fla.	Kissimmee.....Aug. 15..	Aug. 15..	Brick pavement on sand base and 5 miles curbing.....	J. E. Johnston, City & Co. Engineer
O.	Bowling Green.....Aug. 15..	Aug. 15..	Constructing bitu. & water bound mac. roads.....	C. E. Stinebaugh, Co. Aud.
O.	Cleveland Heights.....Noon	Aug. 16..	Grading and constructing sidewalks.....	H. H. Canfield, Vil. Clk.
Ind.	South Bend.....11 a.m.	Aug. 16..	Grading, draining and paving with concrete.....	Clarence Sedgwick, Co. Aud.
La.	New Orleans.....noon	Aug. 16..	Constructing 26 miles highway.....	F. M. Kerr, Chief State Engr.
Mo.	Poplar Bluff.....7.30 p.m.	Aug. 16..	6,500 yards concrete pavement.....	E. C. Thomas, City Engr.
Wash.	Seattle.....10 a.m.	Aug. 16..	Road construction.....	County Commissioners
O.	Bowling Green.....1 p.m.	Aug. 16..	Grading, draining and macadamizing road.....	C. E. Stinebaugh, Co. Aud.
Del.	Wilmington.....Aug. 16..	Aug. 16..	Grading, guttering and laying first class pavements.....	L. D. Christy, Secy.
N. J.	Hackensack.....1 p.m.	Aug. 16..	Repairing Oakland avenue.....	Board Chosen Freeholders.
Minn.	St. Paul.....10 a.m.	Aug. 16..	Grading and improving streets; curbing.....	August Hohenstein, Pur. Agt.
Conn.	Hartford.....2 p.m.	Aug. 16..	Mac. & bitu. macadam road construction.....	C. J. Bennet, State Hwy. Comr.
Mo.	Kansas City.....10 a.m.	Aug. 16..	1 mile bituminized earth pavement.....	A. C. Southern, Co. Surv.
O.	Bowling Green.....2 p.m.	Aug. 16..	Grading, draining, macadamizing and applying bituminous binder.....	L. H. Wismar, Co. Surv.
Pa.	South Bethlehem.....Aug. 16..	Aug. 16..	8,400 yds. Amiesite and 330 yds. brick paving.....	Thos. Ganey, Boro. Sec.
Okla.	Stillwater.....10 a.m.	Aug. 16..	Constructing cement sidewalks.....	J. H. Robison, Mayor
S. D.	Yankton.....9 a.m.	Aug. 16..	Constructing sidewalk.....	J. W. Summers, City Aud.
O.	Adamsville.....11 a.m.	Aug. 16..	Improving 10.1 miles of road.....	F. C. Warner, Clk., Zanesville
Ind.	Terre Haute.....10 a.m.	Aug. 16..	Grad. & pav. with brick, wood blk., asph. or asph. conc.....	E. W. Manson, Sec. P. W.
Pa.	Chester.....10 a.m.	Aug. 16..	Laying 23,000 yds. paving.....	Joseph Messick, Jr., Supt. Sta. & Pub. Imp.
Ill.	Cicero.....8 p.m.	Aug. 16..	Constructing cement sidewalk.....	Charles Stoffel, City Clk.
Minn.	Hibbing.....3 p.m.	Aug. 17..	Pav., curb. & const. 4,500 ft. sewers.....	D. D. Haley, Vil. Rec.
N. Y.	Frankfort.....Aug. 17..	Aug. 17..	Paving with bitulithic and curbing with concrete.....	City Clerk
Ind.	Fort Wayne.....10 a.m.	Aug. 17..	Grading, paving and improving road, two jobs.....	Will Johnson, Co. Aud.
N. Y.	New Brighton.....Noon	Aug. 17..	Constructing cement sidewalks.....	C. D. Van Name, Boro. Pres.
O.	Columbus.....Noon	Aug. 17..	Grading, draining and paving with brick, wood block or asphalt several streets.....	Geo. A. Borden, Dir. P. W.
Fla.	Ft. Meade.....10.30 p.m.	Aug. 17..	30,000 sq. yds. vit. brick asphaltic conc. or bitulithic pav.....	Bd. of Bond Trustees
Ind.	South Bend.....10 a.m.	Aug. 17..	Constructing cement walks and curbs.....	Veronica Sweeney, Clk.
O.	Sandusky.....1.30 p.m.	Aug. 17..	Macadamizing road.....	H. M. Adams, Clk. of Board
N. J.	Elizabeth.....3 p.m.	Aug. 17..	Regrading and improving 4,247 ft. of street.....	J. L. Bauer, Co. Engr.
Wash.	Waterville.....Aug. 17..	Aug. 17..	Drain. & grav. 3.5 miles of road; cost, \$18,000.....	R. F. Foster, Co. Engr.
Tenn.	Memphis.....Aug. 17..	Aug. 17..	Asphaltic concrete paving, to cost \$10,000.....	J. W. Weatherford, City Engr.
Mich.	Howell.....1 p.m.	Aug. 17..	Paving streets.....	L. J. Pettibone, City Clk.
O.	Uhrichsville.....Noon	Aug. 17..	One mile of brick paving.....	H. O. Snider, City Clk.
Minn.	Buffalo.....1 p.m.	Aug. 17..	Constructing state road.....	John A. Berg, Co. Aud.
Ind.	South Bend.....Aug. 18..	Aug. 18..	4.6 miles of concrete road.....	Clarence Sedgwick, Co. Aud.
Mich.	Belding.....Aug. 18..	Aug. 18..	15,000 yds. paving.....	F. E. Conant, City Clk.
Neb.	Lincoln.....Aug. 18..	Aug. 18..	Paving with brick or asphalt concrete, cost \$40,000.....	H. E. Wells, Co. Clk.
O.	Marion.....Aug. 18..	Aug. 18..	Paving bridges with wood block.....	V. Perle Garfield, Clk.
O.	Columbus.....Noon	Aug. 18..	Constructing sidewalks on 26 streets.....	G. A. Borden, Dir. P. S.
N. Y.	Brooklyn.....11 a.m.	Aug. 18..	Regulating, grading and paving streets, 7 jobs.....	L. H. Pounds, Boro. Pres.
Pa.	Allegheny.....10 a.m.	Aug. 19..	Road improvements.....	H. M. Cribbs, Co. Compt.
N. Y.	New York.....3 p.m.	Aug. 19..	75,000 gals. refined coal tar; 75,000 gals. tar road oil; 5,500 yds. trap rock screening and 3,000 yds. grits.....	Cabot Ward, Pres. Pk. Comm.
O.	Rawson.....Noon	Aug. 20..	Grading, curbing and paving with brick.....	C. H. Fetzter, Clk.
Minn.	St. Cloud.....2 p.m.	Aug. 20..	Graveling 3.75 miles of road, estimated cost \$1,883.....	Nicholas Thomey, Co. Aud.
Ala.	Scottsborough.....Aug. 21..	Aug. 21..	Grading and draining 6 1/2 miles road.....	W. S. Keller, State Hwy. Com. Montgomery
Ohio	Toledo.....10 a.m.	Aug. 23..	Improving roads.....	C. J. Sanzenbacher, Co. Aud.
N. J.	N. Brunswick.....2.30 p.m.	Aug. 23..	Constructing brick and bituminous conc. road.....	A. J. Gebhardt, Dir.
O.	Columbus.....10 a.m.	Aug. 23..	Improving and macadamizing roads.....	John Scott, Clk. of Bd.
Cal.	Sacramento.....2 p.m.	Aug. 23..	Constructing sections of state highways.....	A. B. Fletcher, State Hwy. Engr.
Minn.	Shakopee.....11 a.m.	Aug. 23..	Grading, construction & graveling, cost \$14,000.....	A. J. Mayer, Co. Aud.
Neb.	Plattsmouth.....5 p.m.	Aug. 23..	Grading and paving alleys, cost \$1,650.....	J. E. Nemets, City Clk.
Wis.	Neeah.....2 p.m.	Aug. 23..	Cresoted wood block paving, curbing and guttering.....	H. S. Zemloch, Sec. B. P. W.
Ala.	Vernon.....Aug. 24..	Aug. 24..	Grading and graveling road. Cost, \$4,600.....	Engineer
N. Y.	White Plains.....8 p.m.	Aug. 25..	Laying sidewalks and constructing curbs and gutters.....	W. S. Keller, State Hwy. Engr. Montgomery
N. Y.	Scarsdale.....8 p.m.	Aug. 25..	Constructing road.....	W. H. Carpenter, Jr., Vil. Clk.
N. Y.	Albany.....1 p.m.	Aug. 26..	Constructing and repairing state road.....	John Ross, Clk. of Trustees
Ind.	Angola.....1 p.m.	Aug. 26..	Improving highways.....	Edwin Duffey, Comr.
Wis.	Racine.....10 a.m.	Aug. 28..	Constructing 110 ft. of conc. curb and gutter.....	Edwin Duffey, Comr.
Wis.	Green Bay.....2 p.m.	Aug. 30..	Grad. and placing gravel or crushed stone on street.....	City Clerk
Colo.	Denver.....11 a.m.	Aug. 30..	Concrete paving, cost \$15,410.68.....	J. E. Hunter, Pres. B. P. W.
O.	Warrensville.....11 a.m.	Aug. 30..	Grading, draining and constructing sidewalks.....	C. E. Burger, Vil. Clk.
O.	Warren.....1 p.m.	Aug. 30..	Grading & laying 2-course slag on 1,700 ft. of road.....	F. Biemeret, Chr. St. Comm.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Wis.	Green Bay.....	2 p.m., Aug. 30..	Grading and placing gravel and crushed stone.....	W. R. Harrington, Co. Aud.
Mo.	Weston.....	Aug. 31..	4,000 sq. yds. bitu. paving & 1,200 ft. conc. curb & gutter.....	T. Riley, Clerk
Ala.	Thomasville.....	Aug. 31..	Grading, draining and surfacing with sand clay, cost, \$15,600.....	W. S. Keller, State Hwy. Eng., Montgomery.
Tenn.	Tazewell.....	11 a.m., Sept. 2..	Macadamizing 30 miles and grading 28 miles of road.....	J. H. S. Morrison, Chr. Rd. Comrs.
Ind.	Greencastle.....	2 p.m., Sept. 4..	Grading, paving and improving roads.....	C. L. Airhart, Co. Aud.
N. Y.	Lockport.....	Sept. 9..	2,000 yds. brick paving.....	City Clerk

SEWERAGE

Wis.	Appleton.....	9 a.m., Aug. 14..	Constructing sewers.....	E. L. Williams, City Clk.
Neb.	Valentine.....	8 p.m., Aug. 14..	Sewer construction to cost \$5,000.....	W. E. Haley, Vil. Clk.
S. D.	Aberdeen.....	9 a.m., Aug. 16..	980 ft. 8-in. vit. pipe sewers & two manholes.....	F. W. Raymond, City Aud.
Minn.	Winnebago.....	8 p.m., Aug. 16..	Constructing branch sewer.....	H. W. Holley, Engr.
Minn.	St. Paul.....	10.30 a.m., Aug. 16..	Constructing sewers in several streets.....	Aug. Hohenstein, Pur. Agt.
O.	Delaware.....	Noon, Aug. 16..	Constructing sanitary sewers.....	Reno Swickheimer, Clk. P. S.
N. Y.	New York.....	2 p.m., Aug. 16..	Constructing sewer on Ellwood street.....	M. M. Marks, Boro. Pres.
Ill.	Anna.....	Aug. 16..	Constructing sewage disposal plant, cost \$8,000.....	W. S. Shields, Co., 8 So. Dearborn St., Chicago
N. J.	Camden.....	8 p.m., Aug. 16..	Constructing sewers and drains.....	A. B. Sparks, Chr. St. & Hwys. Com.
S. D.	Watertown.....	8 p.m., Aug. 16..	Constr. sewers & sewerage systems to cost \$105,000.....	F. W. Schreiber, City Engr.
Minn.	Mankato.....	2 p.m., Aug. 16..	Constructing drainage ditch.....	C. L. Kennedy, Co. Aud.
Mo.	Poplar Bluff.....	7.30 p.m., Aug. 16..	27,000 ft. 6 to 12-in. pipe, ejector & 35 manholes; cost, \$17,500.....	E. C. Thomas, City Engr.
Ja.	Centerville.....	7.30 p.m., Aug. 16..	Laying pipe & making sewer, water & gas connections.....	R. O. Stephenson, City Clk.
N. Y.	Niskayuna.....	8 p.m., Aug. 16..	Constructing 1,300 ft. sanitary sewers.....	H. B. Furnside, Chr. Sewer Com.
Pa.	Chester.....	10 a.m., Aug. 16..	Const. terra cotta sewers in several streets.....	Jos. Messick, Jr., Supt. Sts. & Pub. Imp.
N. Y.	L. I. City.....	11 a.m., Aug. 17..	Constructing sewers in several streets.....	M. E. Connolly, Boro. Pres.
Wis.	Green Bay.....	Aug. 17..	Constructing steel outlet for sewer terminus.....	Committee on Sewers.
O.	Columbus.....	Noon, Aug. 17..	Constructing sewers in various streets.....	G. A. Borden, Dir. P. S.
Ont.	Toronto.....	Noon, Aug. 17..	Sewer construction.....	T. L. Church, Ch. Bd. Control.
Ill.	Berwyn.....	8 p.m., Aug. 17..	Constructing sewers in several streets.....	O. N. Lindahl, Sec. B. L. I.
Minn.	Stillwater.....	Aug. 17..	Constructing sewers in several streets.....	L. W. Clark, Engineer
Minn.	Montevideo.....	2 p.m., Aug. 18..	Constructing county ditch, estimated cost \$25,850.....	J. J. Stennes, Co. Aud.
Minn.	Breckenridge.....	10 a.m., Aug. 18..	83,500 yds. sewer excavation.....	P. E. Truax, Co. Aud.
N. D.	Fargo.....	10 a.m., Aug. 18..	Constructing 12-in. lateral sewers.....	A. R. Watkins, City Aud.
N. Y.	New York.....	2 p.m., Aug. 18..	Altering and improving sewers, two jobs.....	M. M. Marks, Boro. Pres.
Mass.	El. Gardner.....	Aug. 18..	Building sewerage system for state colony.....	State Bd. of Insanity, Boston
N. Y.	Binghamton.....	4 p.m., Aug. 18..	Vit. pipe sewer and connections.....	D. W. Foster, City Clerk
O.	Cleveland.....	Noon, Aug. 18..	Concrete open channel outfall sewer 630 ft. long and submerged outfall pipe line about 3,600 ft. long.....	A. R. Callow, Com. Pur. & Sup.
W. Va.	Parkersburg.....	10 a.m., Aug. 18..	Constructing 8-in. sanitary sewers in four streets, manholes, house connections, etc.....	Frank Good, City Clk.
N. Y.	L. I. City.....	11 a.m., Aug. 19..	Const. sewers & inlet basins and repaving with improved granite block.....	M. E. Connolly, Boro. Pres.
O.	Cleveland.....	Noon, Aug. 19..	Constructing sewers in several streets.....	A. R. Callow, Com. Pur. & Sup.
O.	Chardon.....	Noon, Aug. 19..	Sewage plant & system, including two 2-sty. sedimentation plant & sludge beds, contact filters & sand filters; also 8 miles 6-12-in. vit. pipe sewer.....	E. A. Fielder, Vil. Engr.
N. Y.	Newburgh.....	7.30 p.m., Aug. 19..	Constructing sewers in several streets.....	D. J. Coupant, City Clk.
Wis.	Oak Creek.....	10 a.m., Aug. 19..	Drainage work, including 12,000 ft. 8 to 18-in. tile.....	P. J. Hurtgen, Burlington
Tex.	Beeville.....	Aug. 20..	Extending sewer system.....	W. G. Gale, City Clk.
Tex.	Dallas.....	Aug. 23..	Constructing sewers and disposal plants.....	J. E. Winslett, City Sec.
Minn.	Sandstone.....	Aug. 23..	Constructing 9,025 ft. 6 to 10-in. sewer, 54 manholes, etc.....	R. Rudisuhle, Vil. Recorder.
Ja.	Pocahontas.....	1 p.m., Aug. 24..	Constructing drainage and tile work.....	L. A. O'Donnell, Co. Aud.
Utah	Salt Lake City.....	10 a.m., Aug. 24..	Sanitary sewer.....	City Engineer
N. J.	Bayonne.....	4 p.m., Aug. 24..	Laying about 3,000 ft. of 20 to 30-in. vit. and c. i. sewers.....	W. P. Lee, City Clk.
Pa.	Lebanon.....	5 p.m., Aug. 25..	Constructing sewage disposal plant complete.....	T. R. Crowell, City Engr.
O.	Marion.....	Noon, Aug. 26..	Constructing sanitary and storm water sewers.....	W. C. Selanders, Dir.
N. J.	Newark.....	Aug. 31..	Superstructure of Meadows pumping station.....	Passaic Valley Sew. Comm.
Ja.	Clinton.....	8 p.m., Sept. 1..	Constructing vitr. and segment block sewers.....	City Clerk
Okl.	Sand Springs.....	Sept. 1..	8,350 ft. 6-in. sewers, cost \$4,000.....	City Clerk
O.	Struthers.....	Sept. 1..	Constructing storm and sanitary sewers and paving sts.....	Jonah Richards, Vil. Clk.
N. Y.	Albany.....	3 p.m., Sept. 7..	Construction of sewage pumping stations.....	Isadore Wachsmann, Sec. B. C. & S.
Fla.	Tallahassee.....	Sept. 9..	Paving, curbing and constructing storm sewers.....	A. H. Williams, City Clk.

WATER SUPPLY

Mont.	Fromberg.....	Aug. 14..	Constructing water works to cost \$17,500.....	C. J. Jones, Town Clk.
O.	Newburgh.....	Noon, Aug. 14..	Construction of water mains.....	H. H. Bohning, Clk.
Ill.	Rock Island.....	Aug. 14..	Laying two blocks 6-in. water mains.....	Wm. McConichie, Pres. B. L. I.
Neb.	Valentine.....	8 p.m., Aug. 14..	Waterworks extension, cost \$4,815.....	W. E. Haley, City Clk.
Ill.	Chicago.....	11 a.m., Aug. 14..	Ten tons lead pipe.....	W. R. Moorhouse, Comr. P. W.
Pa.	Hatfield.....	Aug. 15..	Laying about 2 miles 4 to 8-in. c. i. water pipe.....	Jonas Moyer, Clk. Council.
Tenn.	Columbia.....	Aug. 15..	Installing 1,000,000 gallon filtration plant, new hydrants, pipe and mains.....	J. S. Robinson, Sec. Water & Light Co.
Can.	(Alberta) Drumheller.....	Aug. 16..	Laying water mains, sinking well and constructing pumping station.....	O. McKee, Secy. & Treas.
Ill.	Springfield.....	2 p.m., Aug. 16..	Const. tank and pumping system at Industrial Home.....	Bd. of Administration, 1900 Marshall Blvd., Chicago
O.	Cleveland Heights.....	Noon, Aug. 16..	Laying 12-in. water mains.....	H. H. Canfield, Vil. Clk.
O.	Warrensville.....	Noon, Aug. 16..	Constructing 12-in. c. i. water mains.....	H. H. Canfield, Clk.
N. Y.	Watervliet.....	Aug. 16..	Constructing waterworks system.....	Water Board.
Ill.	Watertown.....	3 p.m., Aug. 16..	C. i. water pipe.....	N. C. Schwab, Cons. Engr., Mellers Bldg., Chicago
Minn.	Crystal Lake.....	8 p.m., Aug. 16..	Laying 2,000 ft. 4 and 6-in. water main.....	W. P. Cobb, City Clk.
Mo.	St. Louis.....	Noon, Aug. 17..	Const. brick & reinforced conc. smoke stack for pumping station.....	E. R. Kinsey, Pres. B. P. S.
Ill.	Berwyn.....	8 p.m., Aug. 17..	Constructing cast iron water supply pipe line.....	O. M. Lindahl, Sec. B. L. I.
Tex.	Beaumont.....	Aug. 17..	Cast iron 30-in. pipe across river and other pipe construction.....	J. G. Sutton, City Secy.
D. C.	Washington.....	10 a.m., Aug. 17..	Furn. wrought iron pipe at Mare Island Navy Yard.....	Bu. of Sup. & Accts.
Wis.	Janesville.....	2 p.m., Aug. 18..	Laying 595 ft. of 6-in., 1,737 ft. 4-in., pipe, one fire hydrant and five valves.....	J. A. Fathers, Chr. B. P. W.
Neb.	Syracuse.....	Aug. 19..	Water works improvements to cost \$8,500.....	Wm. Stanbro, Vil. Clk.
Conn.	Windsor.....	Aug. 20..	Constructing 28,000 ft. 10-in., 6,500 ft. 6-in. water main, 100-ft. standpipe, installing 35 hydrants and furnishing electrically-driven pumping equipment.....	H. R. Turner, Supt., 224 Broad
O.	Sylvania.....	Noon, Aug. 20..	Drilling well and constructing water works.....	Geo. Cook, Vil. Clk.
O.	Brewster.....	Noon, Aug. 20..	Constructing waterworks.....	L. S. Lash, Vil. Clk.
Minn.	St. James.....	7.30 p.m., Aug. 20..	Erecting & installing new equipment in electric light & water works plant.....	Christ Larson, City Clerk
Minn.	Luverne.....	6 p.m., Aug. 24..	For const. reinforced concrete steel reservoir 60 ft. in diameter.....	S. C. Rea, City Rec.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
H. T.	Pearl Harbor	10 a.m., Aug.	24.. C. i. pipe fittings, lead, wrought iron & terra cotta pipe..	Navy Pay Office, Honolulu
Neb.	Milligan	Aug.	24.. Constructing of waterworks system (readvertised).....	Village Clerk
N. Y.	Wellsville	noon, Aug.	25.. Improvements to the water system.....	F. M. Leonard, Clk.
Tex.	Galveston	Aug.	26.. Mechanical equipment of air pumping engine.....	John Kelley, City Secy.
O.	Warrensville	11 a.m., Aug.	30.. Laying 6-in. water mains, two jobs.....	C. E. Burger, VII. Clk.
Ja.	Ogden	8 p.m., Aug.	30.. Extending water mains.....	City Clerk.
Ja.	Riverside	Sept.	1.. Installing water works system.....	City Clerk.
Ja.	Keota	Sept.	1.. Installing water works system.....	City Clerk.
Sask.	Regina	Sept.	6.. Constructing 7 million gallon pumping unit.....	J. W. Mackay, Supt. W. W.
LIGHTING AND POWER				
Minn.	St. Paul	10.30 a.m., Aug.	16.. Furnishing gas posts and connections to gas mains.....	Aug. Hohenstein, Pur. Agt.
D. C.	Washington	Aug.	16.. 12 electric towing locomotives.....	General Purchasing Officer, Panama Canal
Pa.	Pittsburgh	Aug.	21.. Air compressors, gas engines, turbines & elec. light plant.	U. S. Engrs. Office
Okla.	Adams	Sept.	30.. Electric light plant.....	Frank Mann, Engr
N. J.	Cedar Grove	8 p.m., Aug.	21.. Furn. for one year forty 32 c. p. lamps.....	A. H. Jacobus, Secy.
O.	Springfield	noon, Aug.	23.. Furnishing machine tools and equipment.....	W. H. Holmes, Clk. Bd. Edu.
D. C.	Washington	Aug.	24.. Underground signal and telegraph cable.....	District Commissioners
D. C.	Washington	Aug.	24.. Electrical supplies for Navy Department.....	Bu. of Sup. & Accts.
Mont.	Anaconda	Sept.	8.. Movable crest and operating mach. for Vandallia Dam.	U. S. Reclamation Service, Washington, D. C.
FIRE EQUIPMENT				
Minn.	St. Paul	10.30 a.m., Aug.	16.. Rebuilding engine, including new boilers.....	Aug. Hohenstein, Pur. Agt.
N. J.	Guttenberg	Aug.	16.. 1,000 ft. cotton hose.....	W. J. Bramley, Town Clk.
Minn.	Breckenridge	Aug.	16.. Constructing fire station, city hall and jail.....	City Clerk
H. T.	Pearl Harbor	10 a.m., Aug.	17.. Two 2-wheel hose carts & one 2-wheel chemical engine.	Bu. of Sup. & Accts., Wash- ington, D. C.
N. J.	Rahway	8 p.m., Aug.	17.. 1,500 ft. 3 1/4-in. rubber-lined fire hose.....	Frank Stillman, City Treas.
O.	Columbus	noon, Aug.	19.. Automobile and commercial car.....	B. L. Bargar, Dir. Pub. Safety
O.	Toledo	noon, Aug.	27.. 4,000 ft. 2 1/2-in. cotton rubber-lined hose.....	Bernard Groenewold, Dir. P. S.
Ill.	Chicago	Sept.	1.. Constructing 9 fire stations, cost \$215,000.....	Fire Chief.
BRIDGES				
Pa.	Bloomsburg	11 a.m., Aug.	14.. 26-ft. concrete arch bridge.....	C. E. Smith, Co. Clerk
Kan.	Emporia	noon, Aug.	14.. Constructing concrete bridge.....	County Engineer
Cal.	Placerville	Aug.	15.. 162-ft. span steel truss bridge.....	County Supervisors
Ind.	Lebanon	Aug.	15.. Ten steel and concrete bridges.....	E. M. Clark, Co. Aud.
Cal.	Visalia	Aug.	16.. 400 concrete bridge, cost \$20,000.....	County Clerk.
Ore.	Salem	Aug.	16.. Constructing steel truss bridge.....	Max Gehlhar, Co. Clk.
Wash.	Seattle	10 a.m., Aug.	16.. 441-ft. frame trestle.....	Byron Phelps, Clk. of Bd.
Okla.	Kingfisher	Aug.	16.. Constructing 17 steel and concrete bridges, estimated cost, \$21,500.	C. R. Steel, Engineer. County Commissioners.
Mass.	Lawrence	9.30 a.m., Aug.	16.. Rebuilding Loring street bridge.....	County Supervisors
Cal.	Placerville	2 p.m., Aug.	16.. Steel trussed bridge.....	J. I. Miller, Supt. P. W., Co- lumbus
O.	Carthage	2 p.m., Aug.	16.. Repairing aqueduct.....	H. H. Behm, Town Chairman, Hintz
Wis.	Underhill	2 p.m., Aug.	16.. Steel girder bridge across Oconto river.....	L. G. Vogel, Co. Aud.
Minn.	New Ulm	2 p.m., Aug.	16.. Constructing state bridge.....	R. O. Young, Co. Hwy. Supt.
Ill.	Ayers	11 a.m., Aug.	17.. Reinforced concrete bridge, estimated cost \$1,020.....	W. B. Alexander, Co. Aud., Marietta
O.	Dunbar	1 p.m., Aug.	17.. Constructing concrete bridge over Little Hocking creek.	W. B. Alexander, Co. Aud.
O.	Marietta	1 p.m., Aug.	17.. Constructing concrete bridge.....	Clark Co. Comrs.
Ga.	Princeton	Aug.	17.. Constructing steel bridge.....	Tate Right, Clerk.
Ga.	Athens	Aug.	17.. Constructing steel and concrete bridge.....	C. C. Everett, Clk. Co. Comrs.
Kan.	Girard	noon, Aug.	18.. Ten steel and reinforced concrete bridges.....	W. A. Stinchcomb, Co. Surv.
O.	Cleveland	10 a.m., Aug.	18.. Repairs to steel deck bridge.....	F. H. Vogan, Co. Clk.
O.	Youngstown	10 a.m., Aug.	18.. Constructing bridge.....	V. Peble Garfield, Clk. Co. Com.
O.	Marion	noon, Aug.	18.. Reflooring bridges with wood block.....	A. R. Callow, Comr. P. & S.
O.	Cleveland	noon, Aug.	18.. Constructing two concrete box culverts.....	C. L. Kennedy, Co. Aud.
Minn.	Mankato	2 p.m., Aug.	18.. 120-ft. span conc. arch; conc. highway bridge.....	L. P. Sheldon, Co. Clk.
Kan.	Oskaloosa	noon, Aug.	19.. 13 reinforced concrete and steel bridges.....	J. A. Marsh, Co. Judge
Ark.	Searcy	1 p.m., Aug.	19.. Constructing bridge across Little Red river.....	M. G. Hart, Town Clk.
Colo.	Green Mt. Fall	5 p.m., Aug.	20.. Small concrete bridge.....	C. O. Higgins, Co. Aud.
O.	Mt. Gilead	11 a.m., Aug.	20.. Constructing bridge.....	J. L. Means, Co. Aud.
O.	Steubenville	Aug.	20.. Constructing and repairing bridges.....	M. C. McCarthy, Co. Aud.
N. D.	Beach	10 a.m., Aug.	20.. Constructing bridge.....	T. R. Crowell, City Engr.
Pa.	Lebanon	Aug.	20.. Building 3 bridges, reinforced concrete or steel.....	M. C. McCarthy, Co. Aud.
N. D.	Sentinel Butte	10 a.m., Aug.	20.. Constructing bridge across Nutson creek.....	C. R. Wiesel, City Engr.
Cal.	Kennett	Aug.	21.. Wood and steel bridge 1,500 ft. long; cost, \$20,000.....	County Commissioners
Ind.	Richmond	Aug.	21.. Constructing four bridges.....	County Supervisors
Cal.	Redding	Aug.	21.. Constructing steel or concrete bridge 260 ft. long.....	St. Hwy. Comm. Sacramento.
Cal.	Dunsmuir	Aug.	23.. 532-ft. reinforced concrete bridge.....	H. A. Pfister, Clk. of Supv.
Cal.	San Jose	11 a.m., Aug.	23.. Constructing 2-span girder bridge.....	County Commissioners
S. D.	Medora	Aug.	23.. Steel bridge on conc. piers across Little Missouri river..	W. R. Harrington, Co. Aud.
O.	Warren	1 p.m., Aug.	23.. Constructing Summit street bridge.....	County Clerk.
Tex.	Canadian	Aug.	23.. Constructing bridge across Canadian river.....	Eugene Ross, Co. Aud.
Minn.	Wadena	2 p.m., Aug.	23.. Constructing state bridge.....	A. J. Mayer, Co. Aud.
Minn.	Shakopee	11 a.m., Aug.	23.. Grading approaches to bridge.....	A. J. Gebhart, Dir.
N. J.	N. Brunswick	2.30 p.m., Aug.	23.. Constructing steel and concrete culverts.....	John O'Connor, Clk.
Neb.	Fremont	noon, Aug.	24.. Constructing & repairing bridges for one year.....	C. E. Bloomer, Clk.
O.	Norwalk	10.30 a.m., Aug.	24.. Rebuilding several bridges.....	J. A. Cooley, Co. Judge
Tex.	Terrell	2 p.m., Aug.	26.. Constructing conc. culvert, bridges, headwalls, etc.....	Harry Kisinger, Co. Cont.
Pa.	Uniontown	noon, Aug.	26.. Repairing bridges and constructing steel superstructure.	U. S. Engr.
Pa.	Pittsburgh	noon, Aug.	26.. Furnishing bridges and trestles.....	Harrington, Howard & Ash, Engrs., Kansas City, Mo.
Okla.	Tulsa	Aug.	26.. 1,404 ft. span bridge.....	C. O. Huggins, Aud.
Ohio	Mt. Gilead	11 a.m., Aug.	29.. 120 ft. span bridge.....	A. Braun, City Engr.
Wis.	Green Bay	10 a.m., Aug.	30.. Constructing Strauss bascule and swing bridges; esti- mated cost, \$55,000.....	County Clerk.
Pa.	Doylstown	Aug.	31.. Constructing two county bridges.....	C. E. Steinbaugh, Co. Aud.
O.	Bowling Green	1 p.m., Aug.	31.. Creosoted wood block floor on bridge.....	R. R. Hughes, Co. Engr.
Okla.	Tulsa	Sept.	1.. Bridge over Arkansas River; cost, \$200,000.....	C. J. Sanzenbacher, Co. Aud.
O.	Toledo	10 a.m., Sept.	3.. Creosoted wood block floor on bridge.....	Albert Reinhardt, Clk. Co. Commissioners
O.	Cincinnati	noon, Sept.	3.. Rebuilding culvert.....	W. H. Cone, Ordmay.
Ga.	Springfield	2 p.m., Sept.	6.. Constructing steel bridge; estimated cost, \$4,500.....	County Commissioners
Ga.	Statesboro	Sept.	6.. Bridge construction.....	A. P. Davis, Ch. Engr. U. S. Rec. Serv.
D. C.	Washington	2 p.m., Sept.	8.. 300-ft. span steel bridge.....	H. Brocker, Co. Clk.
Kan.	Lawrence	Oct.	6.. Constructing steel bridges.....	
MISCELLANEOUS				
Pa.	Philadelphia	noon, Aug.	16.. Constructing 700 ft. subway.....	A. M. Taylor, Dir. City Transit
Ill.	Springfield	3 p.m., Aug.	16.. Removing old boilers and installing new one at State	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. Y., New York		10.30 a.m., Aug. 17	Hospital at Menard	Board of Administration.
			Correcting acoustic defects in Supreme Court room and other court rooms; 350 tons limestone dust	Douglas Mathewson, Pres. Boro Bronx
N. J., Trenton		Noon, Aug. 17	20,000 cu. yds. filling and grading	E. I. Edwards, Comptroller
O., Columbus		Noon, Aug. 18	Ten rubbish wagons, four dump wagons, four sprinkling wagons and one horse-drawn pressure flusher	G. A. Borden, Dir. P. S.
N. Y., Rochester		10.30 a.m., Aug. 18	3,000 lbs. capacity auto truck	B. N. Chamberlin, Sec. Comrs. of Public Buildings
N. Y., New York		3 p.m., Aug. 19	Furnishing and placing 10,000 tons riprap	Department of Parks
Pa., Wilkes-Barre		Noon, Aug. 20	Constructing concrete retaining wall	C. N. Loveland, Supt. Sts. P. L.
Australia, Adelaide		Aug. 24	Steel self-propelling barge loading bucket dredger	South Australian Harbor Bd.
Tex., Galveston		5 p.m., Aug. 26	Air compressors and surface condenser	J. G. Kelly, City Secy.

STREETS AND ROADS

Russellville, Ark.—Comr. Road Improvement Dist. No. 1 voted \$150,000 bonds for constructing macadam highway from Russellville to Hector.

Los Angeles, Cal.—Council has passed ordinance of intention to improve 24th St. from Maple Ave. to Main St.

Sacramento, Cal.—Road Selection Committee has prepared tentative plan for 160 miles of concrete highway construction.

San Francisco, Cal.—Works Board has requested the Supervisors to allow \$1,100 for surveying and preparing plans and specifications for paving Corbett Ave. from 24th St., this being part of the Market St. extension.

Stockton, Cal.—Council has adopted resolution of intention to pave streets with asphaltic concrete and construct concrete curb and gutters.

Stockton, Cal.—Council has adopted plans and specifications and ordered work of laying an asphalt concrete pavement, together with concrete curbs and gutters on East St., between Poplar and North St.

Bridgeport, Conn.—City has been petitioned to widen Stratford avenue.

Georgetown, Del.—Ernest Palmer, of Wallingford, Pa., was the lowest bidder for the first six miles of the T. Coleman duPont boulevard, which is to be constructed between Frankford and Millsboro. His bid is a little more than \$10,000 a mile. The contract may be awarded this week.

Wilmington, Del.—Ordinance for issuing \$200,000 bonds for road work is before Council. This is last of \$500,000 bond issue for street work, \$300,000 of which has already been spent.

Fort Meade, Fla.—Sealed proposals addressed to the Board of Bond Trustees of Fort Meade, Florida, will be received until 7.30 o'clock P. M. August 17, 1915, for municipal improvement bonds and paving certificates, as follows: Electric Plant Bonds, \$25,500; Water and Sewer Extension Bonds, \$7,500; Street Paving Bonds, \$25,000; Street Paving Certificates, \$40,000 to \$50,000.

New Smyrna, Fla.—Two petitions asking the board of county commissioners to form a special road and bridge district of this part of the county, so that bonds may be voted for the purpose of building and maintaining good roads, will be presented to the commissioners at regular August meeting.

Pineles Park, Fla.—All bids opened July 6 for curbing and paving with brick streets and avenues rejected, being considered too high. To be re-advertised later. Edwards Constr. Co., Tampa, lowest bidder.

Altoona, Ill.—City engineer has completed plans and specifications for 3,877 yds. brick paving on concrete base, 2,430 lin. ft. pitch expansion joint, 840 cu. yds. of grading, 440 lin. ft. new curb and 2,036 ft. of old curb to be reset. Total estimated cost is \$7,316.23.

Fulton, Ill.—Central Engineering Co., Davenport, Ia., low bidders on 12,520 yds. concrete, 7-in. single course, steel protected joints, mix 1:2:3. Price, including integral curbs, \$3.139 per yd. T. J. McCarthy, Davenport, Ia., low bidder on 12,963 yds. brick pavement on concrete base and 2,747 cu. yds. macadam excavation. Price, \$1.71 per sq. yd., including excavation.

Galesburg, Ill.—More than 80 miles of Knox County roads traversing county by two main traveled routes has been designated by the county board for state aid improvement. The first road, with the exception of a small job which was left out in the making of the present state aid road map, is the Rock Island-

Peoria road, and the other is the Cannon-Ball trail.

Streator, Ill.—Council has ordered grading of Court, Bridge, Livingston, Powell and Penn Sts.

South Bend, Ind.—City is contemplating paving several streets with wood block.

South Bend, Ind.—A petition for a new road to connect with the Laporte road southwest of Crumstown is being circulated among land owners in the Kanakakee valley. This project would call for the construction of four miles of new road to connect with nine miles of road now built.

Keokuk, Ia.—City will shortly grade, curb and pave with cement several streets.

New Albany, Ia.—The Floyd County Council have appropriated \$41,000 for the reconstruction of the Paoli pike in county in order to meet the requirements of the Dixie Highway Association. Pike will be 20 ft. wide, with a hard metallic surface and tarvia binder.

Emporia, Kan.—Street Commissioner has recommended grading, curbing and draining of 70 streets and paving many more.

Leavenworth, Kan.—City has passed ordinance declaring it necessary to curb Shawnee St. from the bridge to Eighth St. with artificial stone.

Leavenworth, Kan.—City Commission has ordered paving of several streets.

Minden, Kan.—City is considering oiling streets. Money is now being raised and two cars of oil will be purchased shortly.

Topeka, Kan.—Several petitions for street paving have been presented and have been approved by City Commissioner of Streets.

Lexington, Ky.—Election will be held September 30 to vote on proposed county bond issue of \$300,000, proceeds of which will be expended in construction of roads in the county.

Louisville, Ky.—Council has adopted an ordinance appropriating \$41,000 for the reconstruction of that part of the New Albany and Paoli pike in Lafayette and Greenville townships. The highway will be built to meet the requirements of the Dixie Highway.

Arlington, Md.—Village is considering construction of 40-ft. asphalt road with concrete gutters and curbing on Reisterstown road from city limits to Hayward Ave.

Dowagiac, Mich.—Bonds in sum of \$9,500 have been voted, proceeds of which will be used to pave streets.

Chillicothe, Mo.—City has passed resolution to grade, pave, lay curbs and sidewalks and otherwise improve Elm St. from Ninth St. to Elm Dale road.

Jefferson City, Mo.—County is considering proposition to issue bonds in sum of \$150,000, of which \$100,000 will be expended on road construction and \$25,000 on county jail.

Joplin, Mo.—Council has declared two new oiling districts and will also construct concrete gutter on Seventh St. Petition is also being circulated asking for ten blocks of paving on Main St.

Maryville, Mo.—A special election to vote on proposition to issue \$35,000 road bonds will be held about August 25 or 26.

Hastings, Neb.—Council has created several new paving districts. Work in contemplation will amount to \$300,000.

Kennebec, Neb.—City Council has designated Sept. 7 as the day of the special election, at which time the intersecting street bonds will be voted upon. Bonds to the amount of \$50,000 will be voted upon at this time.

Lincoln, Neb.—City will lay several

miles of paving during remainder of summer.

Bayonne, N. J.—City Commissioners have passed ordinances providing for paving with asphalt, bituminous concrete and granite block a number of streets.

Collingswood, N. J.—Council is considering the proposition of resurfacing the streets of the town by use of a binder of hot asphalt, bitulithic or tarvia. The probable cost of the work is \$10,000.

Freehold, N. J.—Mayor C. E. F. Hetrick, of Asbury Park, has asked Board of Freeholders to expend \$20,000 for improvement of Main St.

Long Branch, N. J.—Council has adopted a resolution authorizing the resurfacing of Atlantic Ave. and to set curbs and place gutters.

Newark, N. J.—City Commissioners have passed resolutions ordering the paving of several streets with bitulithic, concrete, brick and granite block.

Newark, N. J.—Street and water commissioners have adopted resolution for paving and improving streets.

Perth Amboy, N. J.—Council has passed an ordinance of intention to pave several blocks with 2-in. asphalt blocks, granite blocks and vitrified brick.

Plainfield, N. J.—Bids received July 19 for the improvement of Elm St. to Highland Ave. have been rejected and the town clerk has been directed to advertise for bids for the improvement to be returnable on September 7.

Trenton, N. J.—Bids on street paving contracts involving work estimated to cost about \$40,000 were opened at the meeting of the City Commission July 28. The figures submitted for the work were considerably less than those received previous and were lower than the calculations made by the engineering department for the work proposed. The proposals covered bituminous concrete pavements on the following streets: Ardmore, between Greenwood and Hamilton; South Clinton, between Liberty and Remsen; Cooper, between Factory and Market; Fulton, between Hudson and Beatty; Lamberton, between Market and Shepherd; Whittaker, between Hamilton and Clinton. Bids were also opened on the paving of West State St., between Calhoun and Prospect, with vitrified brick; South Willow St., between West State and West Front Sts., and the intersection of Market and Clay Sts. with granite block. On bituminous concrete, the Newton Paving Co. was the lowest of the three bidders on natural asphalt, its bids being on Bermudez and averaging \$1.32 per sq. yd. on all the pavements except South Clinton Ave., upon which it ran up to \$1.44 on account of the haul. The proposals on residuum asphalts ranged from \$1.20 per sq. yd. to \$1.32. The Newton Co. registered the lowest bid on residuums, offering Mexican at \$1.20 per sq. yd. for the near hauls and \$1.33 on others. The West State St. pavement will be laid upon the existing concrete base. The bids ranged from a minimum of 71.54 a sq. yd. to \$1.72, according to make, the contractors bidding on several different kinds. The bidders were Antonio Di Lucia, C. A. Reid, Newton Paving Co., S. J. Clark and the Ginder Construction Co. The granite block bids ranged from \$2.45 to \$3.54 per sq. yd., according to quarry. The bidders were Di Lucia, Reid, Newton Paving Co. and the Ginder Construction Co.

Binghamton, N. Y.—Council has authorized board of contract and supply to contract for construction of brick pavement on bridge over the Delaware, Lackawanna & Western tracks.

Rochester, N. Y.—Crouch Bros. were low in the bids submitted on repair

work in Monroe County at the office of the State Highway Department. Their bid was \$12,377 on repair work, totaling .56 of a mile. Whitmore, Rauber & Vicinus submitted a bid of \$12,412.95 on the work, while Morrison & Quinn's bid was \$12,867.30. I. M. Ludington & Son bid \$13,455.75, and Shaw & Lakin, of Jamestown, submitted a bid of \$14,205.30.

Rockaway Beach, L. I., N. Y.—An appropriation of \$80,000 has been made to repave the Boulevard with asphalt block. On account of heavy traffic now, call for bids has been deferred and work will not begin until the middle of September.

Utica, N. Y.—Board of Contract and Supply has received bids for paving work from Harry W. Roberts Company as follows: For paving Kenyon Court, from Genesee St. to Butterfield Ave., sheet asphalt, with natural stone curb, \$5,515.50; with artificial stone curb, \$5,036; bitulithic, with natural stone curb, \$6,025.50; with artificial stone curb, \$5,540; asphaltic concrete, with natural stone curb, \$5,396.50; with artificial stone curb, \$4,917. For resurfacing Elm St., between Eagle and Leah Sts., sheet asphalt, \$3,174.10; bitulithic, \$3,438.90; asphaltic concrete, \$2,967.70. The pavement and curbing is to be designated by the property owners.

White Plains, N. Y.—Five bids have been received for the laying of sidewalks on Park Circle. They were from W. A. Neily, of Tarrytown, Toro Paridiso, Petro Luciano, Frank Cestone and Edward Jackson.

Yonkers, N. Y.—Following bids have been opened for improving Palisade Ave.: Macadam, Kearns & Hart, \$17,081; telford macadam, Thomas Crimmins, \$23,871.30; standard granite block, John O. Weston, \$26,991; small granite block, Kearns & Hart, \$28,365.25; asphalt block, Hastings Paving Co., \$22,711.06; vitrified brick, Kearns & Hart, \$20,994.25; sheet asphalt, Kearns & Hart, \$22,872.25; bitulithic, Kearns & Hart, \$22,417.35; bitulithic, bit. base, Warren Bros., \$19,228.37. For the Park Ave. job: Thos. Crimmins was low on telford macadam, at \$15,786.40; on standard granite block, \$62,065.40; on small granite block, \$62,605.80; Hastings company, on asphalt block, \$29,457.68; Kearns & Hart on vitrified brick and sheet asphalt at \$32,160.75 and \$37,408, respectively, and Warren Bros., on two bitulithics at \$35,762.25 and \$32,098.45. For the Shonnard place job Kearns & Hart were low on macadam at approximately \$4,000. Thomas Crimmins on telford macadam, at \$1,783; also on standard granite block, small granite block and vitrified brick, at \$10,459, \$10,469 and \$8,908. On asphalt block the Hastings company bids \$4,718.60; on sheet asphalt, Kearns & Hart, \$5,333.75, and on the two bitulithics, Warren Bros., \$5,715 and \$5,095.

Bexley, O.—Bids will be received until noon Sept. 4 for purchase of bonds in sum of \$63,000, proceeds of which will be spent in improving streets.

Bowling Green, O.—Bids will be received until 1 p.m. Aug. 13 for \$26,000 bonds, proceeds of which will be used to construct roads.

Columbus, O.—City will pave streets with brick and asphalt, construct drains, curbs and gutters, and lay water service pipes.

Columbus, O.—Sealed bids will be received at office of Board of County Commissioners until 10 a. m., Aug. 19, for purchase of county road improvement bonds in sum of \$121,500.

Lima, O.—City will pave State St. from Cole St. to Woodland Ave. with brick, asphalt macadam, asphalt block or sheet asphalt on concrete base.

Lisbon, O.—Arrangements are being made for issue of bonds to pay for road construction.

Mt. Vernon, O.—Bids will be received until 1 p.m. Aug. 30 for purchase of bonds aggregating \$15,000, proceeds of which will be expended in constructing and improving Section "H" of the Columbus-Wooster road.

Newark, O.—City has decided to gravel and improve several streets. Hard surface pavement will be laid on other streets.

Springfield, O.—Bids on paving Clifton St. have been received. The complete tabulation is as follows, the property owners' share being the first set of figures and the street railway track the second: Sheet asphalt, Caffrey, \$11,018.60. \$3,780. Payne, \$11,093. \$3,780; Krumholtz & Huonker, \$12,287.50. \$3,920; J. J. McHugh \$11,597. \$3,850; M. J. Hannon, \$12,348.50. \$3,990. For asphaltic concrete the track paving remains the same and the other bids were as fol-

lows: Caffey, \$9,610.60; Payne, \$9,621; Krumholtz & Huonker, \$9,919.50; McHugh, \$10,189; Hannon, \$10,364. Bids on brick were: Caffey, \$11,338.60; Payne, \$11,989; Krumholtz & Huonker, \$12,287.50; McHugh, \$12,301; Hannon, \$12,348.50. The engineer's approximate estimate was \$14,286.60.

Youngstown, O.—City will grade Hazelwood Ave. from Mahoning Ave. to Austin St.

Youngstown, O.—City has passed ordinance to issue bonds in sum of \$16,000 for street improvements and \$2,000 for sidewalk and crosswalk construction.

Zanesville, O.—City proposes to pave Second, Third and Fifth Sts. with brick, Lake Drive and Dewett Drive with concrete. W. W. Roach, Dir. Pub. Service.

Eugene, Ore.—Only two bids on paving were submitted. They were from the Clark-Henry Construction Co. and the Warren Construction Co., and provided for the paving of Alder, from 13th St. south to the city limits, or a total of 11 blocks. The bids were as follows: For a 5-in. concrete base and a 2-in. bitulithic wearing surface: The Warren Construction Co., \$34,728.61, or \$1.85 per yd.; the Clark-Henry Construction Co., \$32,915.64, or \$1.73 per yd.

Florence, Ore.—The city council is making plans to build the plank road between Florence and the North Fork of the Siuslaw. The survey has been made.

Florence, Ore.—City is preparing for bond issue of about \$6,000, proceeds of which will be spent in building first class road.

Portland, Ore.—Following bids were received by city for paving: Section A, 6,575 ft., Boyajohn-Arnold Co. bid \$1.18 a sq. yd. on bitulithic on a crushed stone base. Oskar Huber bid \$1.19 and the Warren Construction Co. bid \$1.20. On Sections B, G, H and I, of 500 ft. each, bitulithic on a concrete base Huber bid \$1.89, the Warren people \$1.91 and Boyajohn-Arnold \$2.10. On maintenance for 10 years the Boyajohn-Arnold Co. bid half of 1 cent per sq. yd. a year; the Warren Construction Co. offered maintenance at .00031 a sq. yd. a year and Huber bid .0006 a sq. yd. a year.

Chester, Pa.—Commissioners of Upper Darby Township have passed resolutions to permanently pave First, Second and Third Sts. and Powell Ave.

Chester, Pa.—Commissioner Messick has been granted permission to advertise for bids for the paving of the following streets: Caldwell St. from Third to Sixth St.; Ninth St., Edgmont Ave. to bridge; Flower St. from Second to Third St.; Wilson St. from Front to Sixth St.; Edgmont Ave., 24th St. to city line, and for the construction of sewers on 24th St. to city line; West Fifth St. and on Ninth St. from Reaney to Engle Sts. In the advertisement the contractors will be asked to bid for brick gutters.

South Bethlehem, Pa.—The ordinance for the widening and grading of East Fourth St. from Hill St. eastward to the borough line has been passed and advertisements for bids for the work ordered placed.

Titusville, Pa.—Resolution of intention of grading streets and laying concrete sidewalks has been passed.

Wilkes-Barre, Pa.—Sugar Notch Council will issue bonds to extent of \$14,000, the proceeds of which will be used to construct pavements on Main St.

Pawtucket, R. I.—Ordinances confirming the sale of bonds were concurred in by the Common Council at a special session. The ordinance confirms the sale of bonds to the Sinking Fund Commission, amounting to \$380,000, the issues being classed as follows: Schools, \$200,000; highways and bridges, \$150,000; fire station, \$5,000; motor fire apparatus, \$25,000.

Greenwood, S. C.—A \$100,000 bond issue for permanent street paving has been voted here. A \$35,000 bond issue for the city schools also carried. Work on the street paving will begin as soon as the bonds are sold, which, in all probability, will be within the next few weeks.

Bristol, Tenn.—City will expend at once about \$6,000 in macadamizing roads.

Bristol, Tenn.—Approximately \$2,500,000 is to be spent for a system of good roads in East Tennessee, the most of this sum having already been appropriated by the various counties for this purpose. This is in addition to the heavy expenditures that have already been made in numerous counties, including Sullivan, which alone has spent \$500,000 and will spend \$200,000 more at once. Seven East Tennessee counties,

through their county courts, last month voted a total of \$1,642,000 for the building of macadamized highways, while Hawkins County recently voted \$300,000 in addition to Sullivan County, which has voted \$100,000 more, while Washington County will during the present year vote \$250,000. The counties that this month voted \$1,642,000 are Claiborne, Scott, Blount, Carter, Sullivan, Hancock and Union, all in East Tennessee.

Rutledge, Tenn.—An election will be held in Grainger County Sept. 9 for purpose of voting on bond issue of \$200,000, proceeds of which will be used for constructing and improving roads.

Williamsburg, Tenn.—Only three sealed bids having been filed with the county clerk, the contract for constructing a macadam road between this place and Corbin was not let. The bids were rejected and the county clerk will re-advertise them for Aug. 9 according to the instructions of the fiscal court.

El Paso, Tex.—Resolutions have been adopted ordering the paving of Federal St., from Kentucky to Louisiana Aves.; South Kansas St. from the south line of improvement district No. 1 to 8th St.; Prospect Ave., from Upson Ave. to West Boulevard; Blocker St., from Mesa Ave. to Ange St.; Stevens Ave., from G. H. & S. A. reservation to the canal; Myrtle Ave., from Ange St. to Eucalyptus Ave.; Newman St., from Montana to Nevada Sts.

Lampasas, Tex.—Ordinance has been passed requiring construction of about eight miles of cement concrete sidewalks.

Terrell, Tex.—The sale of the \$300,000 good roads bonds of the Terrell district has been consummated and the sale approved by the Attorney General's department at Austin. The local road supervisors say the engineer is already here and it is expected that work will begin by Sept. 1.

Hamlin, W. Va.—Lincoln County contemplates constructing paved or macadam roads and will vote on bonds.

Piedmont, W. Va.—City will soon vote on \$36,000 bonds to improve streets.

Sheboygan, Wis.—Board of Public Works has recommended that Grant Ave., from Fifth to Sixth St., be paved and sewer, water and gas connections made.

CONTRACTS AWARDED.

Huntsville, Ala.—Contract awarded to Bruce Redmond, of Chattanooga, at approximately \$100,000, to pave streets of Huntsville.

Tucson, Ariz.—Contract for constructing bitulithic paving on various streets has been awarded to Warren Bros. Co., California Bldg., Los Angeles, at \$118,495.05.

Helena, Ark.—Contract awarded to Southern Bitulithic Co., Nashville, Tenn., for paving Perry St., at \$41,000.

Richmond, Cal.—The City Council has awarded a contract for paving North Tenth St. with bitulithic to John Word at \$14,251.

Sacramento, Cal.—Bids were received July 26 by the State Highway Commission for constructing roads in various counties as follows: (a) Colusa County, Division 3, Route 7, Section A, (b) Monterey County, Division 5, Route 2, Section D, (c) San Luis Obispo County, Division 5, Route 2, Section B, (d) Marin County, Division 5, Route 1, Section A, (e) Santa Barbara County, Division 5, Route 2, Section D; Clark & Henry Construction Co., Sacramento, (a) \$5,779; A. W. & C. H. Gorrell, San Francisco, (b) \$72,848, (c) \$70,864; W. A. Dontanville, Salinas, (b) \$69,064, (c) \$74,492; Hoffmann & McLaren, Oakland, (b) \$63,395; Lou G. Hare, Salinas, (b) \$76,527; Highway & Paving & Construction Co., San Francisco, (b) \$54,507; Twohy Bros., San Francisco, (b) \$85,437, (c) \$82,791, (d) \$52,084; Tieslau Bros., San Francisco, (b) \$73,966, (c) \$74,802, (d) \$28,883, (e) \$71,802; Petersen & Grier, San Francisco, (b) \$66,733, (c) \$78,191; F. Rolandi, San Francisco, (c) \$72,651, (d) \$29,088, (e) \$73,685; Leigh G. Garnsev, Los Angeles, (c) \$76,362, (e) \$67,959; Bent Bros., Los Angeles, (c) \$72,495; Pacific Coast Construction Co., Fresno, (c) \$69,396; Bates Borland & Ayer, Oakland, (c) \$75,079, (d) \$26,849, (e) \$61,564; Seabury B. Peterson, San Francisco, (c) \$74,748; John D. Marsh, Bakersfield, (c) \$67,809; Palmer & McBryde, San Francisco, (d) \$25,489; Daniel O'Day Co., San Francisco, (d) \$29,201; Bayer & Beard, Two Rivers, (d) \$27,421; W. J. Schmidt, Berkeley, (d)

\$34,872; Erickson & Petterson, Inc., San Francisco, (d) \$34,290; Spring Construction Co., Berkeley, (d) \$30,858; Sunset Construction Co., San Francisco, (d) \$31,552; Fairbanks & Baechtel, Willits, (d) \$29,961, (b) \$69,919; R. B. Markle, Jr., San Francisco, (d) \$21,255; Theodore Manetas, San Francisco, (d) \$26,504; J. H. Falconer, Pinole, (d) \$23,498; G. W. Conners, Eureka, (d) \$26,885, (e) \$63,005; O'Brien Bros., Martinez, (d) \$23,220; Contra Costa Construction Co., Berkeley, (d) \$27,532; P. H. Hoare, Oakland, (d) \$24,476; C. H. Hudson, Los Angeles, (e) \$54,586; Maurice Ryan & Son, El Centro, (e) \$65,293; Richmond Rothwell, Los Angeles, (e) \$60,631; Robert Sherer, Los Angeles, (e) \$58,148; Occidental Construction Co., Los Angeles, (e) \$69,655; F. L. Smith Co., Eureka, (e) \$59,466; F. H. Green, Eureka, (e) \$59,994; E. J. Hunt, Santa Margarita, (e) \$61,831.

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San Diego, Cal.—Contract has been awarded to California-Arizona Construction Co. for paving streets at 18.3 cts. per sq. ft. and 37 cts. per lin. ft. for curbing.

San Francisco, Cal.—The Works Board has awarded contracts for paving and otherwise improving streets as follows: Vermont St., between Mariposa and 17th, to Flinn & Treacy, for \$7,204; McAllister St., between North Stanyan and Parker, to City Street Improvement Co., for \$5,061; Mariposa, between San Bruno and Vermont, to F. R. Ritchie, for \$3,084.

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Stockton, Cal.—Contract for laying pavement under Topeka specifications has been awarded to Eaton & Smith, of San Francisco, on bid of \$84,556. Other bidders were Federal Construction Co., at \$98,007.55, and Clark & Henery, at \$99,003.03.

Vernon, Cal.—The contract for paving Alameda St., from 38th to 56th St., has been awarded to the Los Angeles Paving Co., Hellman Building, Los Angeles.

Glastonbury, Conn.—The R. G. Miller Contracting Co. secured contract at \$1.40 per sq. yd. for construction of 4,500 lin. ft. of macadam road, 14 ft. wide, on Maubuc Ave.

Hartford, Conn.—The following contracts have been awarded by State Highway Commissioner, Charles J. Bennett: Town of Vernon, about 2,675 ft. of bituminous native stone macadam road on Vernon Ave. to A. D. Bridges Sons, Inc., Hazardville, Conn., for approximately \$4,843.10. Town of Ashford, about 14,960 ft. of graded road on the Warrenville road, to the Connecticut Good Roads & Construction Co., New Britain, Conn., for approximately \$21,765.89. Town of Waterford, a reinforced concrete slab bridge over Jordan Brook in the town of Waterford, to Fred D. Miller, Norwich, Conn., for approximately \$1,140.

Georgetown, Del.—Bids have been opened as follows on construction of T. Coleman Du Pont Blvd. The road will be constructed 14 ft. wide, reinforced concrete. The Utility Construction Co., of New Brunswick, N. J., was the lowest bidder and it is probable the contract will be awarded to that company. The bidders and their estimates are: Juniata Construction Co., Philadelphia, \$38,297.96; Utility Construction Co., New Brunswick, N. J., \$35,543.87; Atlantic Bitulithic Co., Richmond, Va., \$35,902.90; Pugh & Hubbard, Philadelphia, \$37,320.33; W. C. Evans, Philadelphia, \$39,371.95; Sutton & Corson, Ocean City, N. J., \$37,216.17.

Jacksonville, Fla.—Bids have been opened for laying of 1,875 sq. yds. of asphalt pavement on Duval St., between Main and Laura Sts. The Atlantic Bitulithic Co. was the only bidder. The

contract was awarded for \$4,926.

Sarasota, Fla.—Contracts have been awarded for paving portions of Palm St. to the Southern Asphalt & Construction Co., Birmingham, Ala., and Strawberry St. to the Georgia Engineering Co., Augusta, Ga.

Goshen, Ind.—Contract awarded to A. Smith, of Elkhart, for constructing ten miles of Lincoln highway with concrete at \$57,575.

Greenfield, Ind.—The County Commissioners awarded the contract for the three-mile road east of here to Everett McMahon for \$7,979. The road is to be of gravel.

La Porte, Ind.—George M. Gross, of La Porte, has been awarded the contract for building the John G. Moyer road, 1.2 miles long, in Lincoln Township. The price is \$6,430. Louis Martine bid \$6,494 and Moyer & Goodall bid \$6,445.

Nabb, Ind.—Contract awarded to Werle & Pass, of Sellersburg, Ind., at \$8,350, for construction of J. C. Bowen free gravel road. Martin F. O'Neill, of Jeffersonville, bid \$18,499.

South Bend, Ind.—Contract for the paving of Franklin St., from Sample to Indiana Ave., has been awarded to C. H. DeFrees by the Board of Works. The contract price is \$13,518.54. The street is to be paved with the iron stone block.

Council Bluffs, Ia.—Contract awarded to E. A. Wickham for brick paving at \$2.13 per sq. yd. and for grading at \$0.65. Other bidders were: Lana Construction Co., paving \$2.13, grading \$0.75; George D. Orr Co., \$2.18 for paving and \$0.80 for grading.

Fulton, Ia.—Contract for paving Lincoln Way with brick awarded to T. J. McCarthy, of Davenport; contract for paving 15th Ave. with concrete awarded to Central Engineering Co., of Davenport.

Oelwein, Ia.—Paving contracts have been let to lowest bidders as follows: Class A, using Trinidad asphalt, asphaltic-concrete, First, Second, Third Aves. and Fourth St. N. Western Improvement Co. Racine, Wis. The cost of this will be \$1.46 per sq. yd. This company will also pave the West Charles St. bridge with brick blocks at \$2.15 per sq. yd. Bitulithic, First and Second Sts. and Fourth Ave. S. First and Fifth Sts. E. and First Ave. W. Ford Paving Co., Cedar Rapids. This was let at \$1.99 per sq. yd. Portland cement concrete, the alleys to be paved. Dearborn Construction Co., Waterloo. The price of this is \$1.23 per sq. yd. and is to be laid in one course of 6 ins. in thickness.

Spencer, Ia.—The Bryant Asphalt Paving Co., of Waterloo, has been awarded contract for the construction of 75,000 sq. yds. of sheet asphalt pavement and 2 miles of curbing at \$125,000.

Trenton, Ia.—The C. A. Reid Co. has been awarded the contract for paving with granite block the Market-Clay Sts. intersection. The bid was \$3.38 a sq. yd. The granite block contract for South Willow St. hill went to Antonio Di Lucia at \$3.18 a sq. yd. Antonio Di Lucia was awarded the contract for paving West State St. between Calhoun and Prospect Sts. with vitrified block. His bid was \$1.55 per sq. yd., the block to be laid upon the existing concrete base. The total cost is \$5,678.50. Contracts were let to Newton Paving Co. for paving with Bermudez asphalt as follows: Ardmore Ave., between Greenwood and Hamilton Aves., \$1.32 \$9,469.46; South Clinton Ave., between Liberty and Remsen Sts., \$1.44 \$5,945.49; Cooper, between Factory and Market Sts., \$1.34 \$5,011.50; Fulton, between Hudson and Beatty Sts., \$1.34 \$4,928.50; Lamberton, between Market and Shepherd, \$1.34 \$5,672.75; Whittaker, between Hamilton and Clinton, \$1.34 \$14,895.50.

Middlesboro, Ky.—The Fiscal Court of Bell County has let contract for grading the road from Pineville to the Cumberland River in the direction of Harlan County to Calvin, a distance of six miles, to Martin Green, Robert Vanbever and Edward Pursfull, of Pineville.

Paducah, Ky.—Contract awarded to Austin Road Roller Co. of Chicago for single cylinder motor roller and scarifier at \$2,950, and four road graders at \$125. Yancev & Johnson were low bidders at \$2,000 on construction of road.

Mansfield, La.—Ritchey Bros., of Lake Charles, have secured contract for 10-130 sq. yds. of 3-in. vertical fibre brick pavement: 3,500 lin. ft. of curb, and 5,600 lin. ft. of storm sewer for city.

Sturgis, Mich.—Contract for con-

structing 20,000 sq. yds. brick paving has been awarded to Moellering Construction Co., Fort Wayne, Ind., at \$43,000.

Carlton, Minn.—Contract awarded to Erickson & Long for constructing North County road at \$5,333. Other bidders were Lewis Leimer, \$5,807; Victor Carlton, \$6,674; Sam Fredreichson and Andrew Johnson, \$9,213. Contract awarded to Elmer Swanson of Chisholm for constructing judicial road at \$2,734.

Duluth, Minn.—Contracts for the grading of 20th Ave. west, from Superior to First St., have been awarded to Olson & Johnson, on their bid of \$3,974.70, and for the paving of Second alley, from 24th to 25th Aves. east, with concrete, to J. Johnson, on his bid of \$1,657.53.

Virginia, Minn.—Contract for constructing 17 blocks pavement with creosoted wood blocks has been awarded to Lawrence-McCann Co., Eveleth, Minn., at \$54,000.

Kansas City, Mo.—Contracts for street improvements have been let as follows: Norton Bros., \$1,553.01; Ed. Meegan, \$2,635.10; Weaver Bros., \$361.50; Missouri Sidewalk Co. (4 jobs), \$173.44, \$118, \$183.20 and \$640.73; Reliance Construction Co., \$334.92; F. P. McCormick, \$2,680.53; Cleveland Trinidad Paving Co. (2 jobs), \$2,373.07 and \$347.70; J. O'Connor & Son, \$6,533.50; A. Jaicks & Co., \$3,551.40; Weaver Bros., \$1,610.90; F. P. McCormick, \$984.20; D. T. Brosnahan (2 jobs), \$468 and \$971.10.

Livingston, Mont.—A paving contract in excess of \$50,000 has been let by the Warren Construction Co. and work is expected to start in about two weeks.

Missoula, Mont.—City has received bids on 6,600 yds. bitulithic pavement laid on a 5-in. concrete base and on 1,200 yds. gravel excavation as follows: J. C. McGuire, Butte, Mont., \$2.37 per sq. yd. for paving and 90 cts. per cu. yd. for excavation; total bid, \$21,252; M. F. Rohn Construction Co., Portland, Ore., \$2.55 for paving and \$1.25 for excavation, total bid \$23,592; G. H. Nash & Co., \$2.50 for paving and 90 cts. for excavation, total bid \$22,328. All bids included a 5-year guarantee.

Kearney, Neb.—Contract for constructing road 3,074 ft. long and 68 ft. wide has been awarded to John Beebe, Omaha, Neb., at \$1.95 per sq. yd. complete. Will require 22,547 sq. yds. vertical fibre brick, asphalt filter pavement and 5,165 cu. yds. grading.

Elko, Nev.—The Commissioners of Elko County have awarded a contract for the construction of the Secret Pass Rd., 16 miles from Halleck, to the Smith-Sprague Co., Salt Lake City, Utah, at \$9,980.

Hackensack, N. J.—Contract awarded Uvalde Asphalt Paving Co., 1 Broadway, New York, N. Y., for constructing road from Nutley bridge to Belleville Turnpike, at \$38,470.

Hoboken, N. J.—The contract for grading and repaving portions of Third, Fourth, Fifth, Sixth, Jefferson, Adams, Hudson, River and 14th St. and Willow Ave. has been awarded to the Uvalde Asphalt Paving Co., at \$42,040.

Perth Amboy, N. J.—Contracts for paving one block on Front St. and for curbing a portion of Compton Ave. have been awarded to Liddle & Pfeiffer and Graham & McKeon, respectively.

Albany, N. Y.—Contracts for paving various streets have been awarded by the Bd. of Contract and Supply as follows: State St. to John H. Crumond, at \$30,271.40; Bancker, Mercer, Peyster and Warren Sts. and Main, Park and Rychman Aves. to Gleason & Davitt, at \$95,618.17; Quail St. to the Langan Construction Corp., at \$4,172.20; Dand St. to John H. Crumond at \$5,854; 3d St. to B. W. Mulderry at \$12,488.63; Glendale and Highland Aves. to Gleason & Davitt, at \$17,756.50; grading a portion of Eastern Park to Martin Murray & Co., at \$30,743.10.

Albany, N. Y.—Contract for building the main section, known as Part 1 and 2 of the Storm King highway, was awarded to-day to the John L. Hayes Construction Co. of Yonkers. The bid of the company was \$273,736.70, and was the lowest of those received. The section is 4.3 miles long. The contract for Part 3, which is 1.7 miles long, was awarded to Nardone & Patrillo of Mt. Vernon, N. Y., for \$13,341.90.

Binghamton, N. Y.—Bids were opened by the State Highway Department in Albany for repair work on Chenango River Rd. from the Binghamton City limits north, past the County Farm. The successful bidder was Charles E. Haney,

\$34,872; Erickson & Petterson, Inc., San Francisco, (d) \$34,290; Spring Construction Co., Berkeley, (d) \$30,858; Sunset Construction Co., San Francisco, (d) \$31,552; Fairbanks & Baechtel, Willits, (d) \$29,961, (b) \$69,919; R. B. Markle, Jr., San Francisco, (d) \$21,255; Theodore Manetas, San Francisco, (d) \$26,504; J. H. Falconer, Pinole, (d) \$23,498; G. W. Conners, Eureka, (d) \$26,885, (e) \$63,005; O'Brien Bros., Martinez, (d) \$28,220; Contra Costa Construction Co., Berkeley, (d) \$27,532; P. H. Hoare, Oakland, (d) \$24,476; C. H. Hudson, Los Angeles, (e) \$54,586; Maurice Ryan & Son, El Centro, (e) \$65,293; Richmond Rothwell, Los Angeles, (e) \$60,631; Robert Sherer, Los Angeles, (e) \$58,148; Occidental Construction Co., Los Angeles, (e) \$69,655; F. L. Smith Co., Eureka, (e) \$59,466; F. H. Green, Eureka, (e) \$59,994; E. J. Hunt, Santa Margarita, (e) \$61,831.

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ulithic Co. was the only bidder. The contract was awarded for \$4,926.

Sarasota, Fla.—Contracts have been awarded for paving portions of Palm St. to the Southern Asphalt & Construction Co., Birmingham, Ala., and Strawberry St. to the Georgia Engineering Co., Augusta, Ga.

Goshen, Ind.—Contract awarded to A. Smith, of Elkhart, for constructing ten miles of Lincoln highway with concrete at \$57,575.

Greenfield, Ind.—The County Commissioners awarded the contract for the three-mile road east of here to Everett McMahon for \$7,979. The road is to be of gravel.

La Porte, Ind.—George M. Gross, of La Porte, has been awarded the contract for building the John G. Moyer road, 1.2 miles long, in Lincoln Township. The price is \$6,430. Louis Martine bid \$6,494 and Moyer & Goodall bid \$6,445.

Nabb, Ind.—Contract awarded to Werle & Pass, of Sellersburg, Ind., at \$8,350, for construction of J. C. Bowen free gravel road. Martin F. O'Neill, of Jeffersonville, bid \$18,499.

South Bend, Ind.—Contract for the paving of Franklin St., from Sample to Indiana Ave., has been awarded to C. H. DeFrees by the Board of Works. The contract price is \$13,518.54. The street is to be paved with the iron stone block.

Council Bluffs, Ia.—Contract awarded to E. A. Wickham for brick paving at \$2.13 per sq. yd. and for grading at \$0.65. Other bidders were: Lana Construction Co., paving \$2.13, grading \$0.75; George D. Orr Co., \$2.18 for paving and \$0.80 for grading.

Fulton, Ia.—Contract for paving Lincoln Way with brick awarded to T. J. McCarthy, of Davenport; contract for paving 15th Ave. with concrete awarded to Central Engineering Co., of Davenport.

Oelwein, Ia.—Paving contracts have been let to lowest bidders as follows: Class A, using Trinidad asphalt, asphaltic-concrete, First, Second, Third Aves. and Fourth St. N. Western Improvement Co. Racine, Wis. The cost of this will be \$1.46 per sq. yd. This company will also pave the West Charles St. bridge with brick blocks at \$2.15 per sq. yd. Bitulithic, First and Second Sts. and Fourth Ave. S. First and Fifth Sts. E. and First Ave. W. Ford Paving Co., Cedar Rapids. This was let at \$1.99½ per sq. yd. Portland cement concrete, the alleys to be paved. Dearborn Construction Co., Waterloo. The price of this is \$1.23 per sq. yd. and is to be laid in one course of 6 ins. in thickness.

Spencer, Ia.—The Brvant Asphalt Paving Co., of Waterloo, has been awarded contract for the construction of 75,000 sq. yds. of sheet asphalt pavement and 2 miles of curbing at \$125,000.

Trenton, Ia.—The C. A. Reid Co. has been awarded the contract for paving with granite block the Market-Clay Sts. intersection. The bid was \$3.38 a sq. yd. The granite block contract for South Willow St. hill went to Antonio Di Lucia at \$3.18 a sq. yd. Antonio Di Lucia was awarded the contract for paving West State St. between Calhoun and Prospect Sts. with vitrified block. His bid was \$1.55 per sq. yd., the block to be laid upon the existing concrete base. The total cost is \$5,673.50. Contracts were let to Newton Paving Co. for paving with Bermudez asphalt as follows: Ardmore Ave., between Greenwood and Hamilton Aves., \$1.32, \$9,469.46; South Clinton Ave., between Liberty and Remsen Sts., \$1.44, \$5,945.49; Cooper, between Factory and Market Sts., \$1.34, \$5,011.50; Fulton, between Hudson and Reatty Sts., \$1.34, \$4,928.50; Lamberton, between Market and Shepherd, \$1.34, \$5,672.75; Whittaker, between Hamilton and Clinton, \$1.34, \$14,895.50.

Middlesboro, Ky.—The Fiscal Court of Bell County has let contract for grading the road from Pineville up the Cumberland River in the direction of Harlan County to Calvin, a distance of six miles, to Martin Green, Robert Vanhever and Edward Pursfull, of Pineville.

Paducah, Ky.—Contract awarded to Austin Road Roller Co. of Chicago for single cylinder motor roller and scarifier at \$2,950, and four road graders at \$25,000. Yancey & Johnson were low bidders at \$3,000 on construction of road.

Windsorfield, La.—Ritchey Bros., of Lake Charles, have secured contract for 10,000 yds. of 3-in. vertical fibre brick for 3,500 lin. ft. of curb and 5,600 sq. yds. of storm sewer for city.

Mich.—Contract for con-

structing 20,000 sq. yds. brick paving has been awarded to Moellering Construction Co., Fort Wayne, Ind., at \$43,000.

Carlton, Minn.—Contract awarded to Erickson & Long for constructing North County road at \$5,333. Other bidders were Lewis Leimer, \$5,807; Victor Carlton, \$6,674; Sam Fredreichson and Andrew Johnson, \$9,213. Contract awarded to Elmer Swanson of Chisholm for constructing judicial road at \$2,734.

Duluth, Minn.—Contracts for the grading of 20th Ave. west, from Superior to First St., have been awarded to Olson & Johnson, on their bid of \$3,974.70, and for the paving of Second alley, from 24th to 25th Aves. east, with concrete, to J. Johnson, on his bid of \$1,657.53.

Virginia, Minn.—Contract for constructing 17 blocks pavement with creosoted wood blocks has been awarded to Lawrence-McCann Co., Eveleth, Minn., at \$54,000.

Kansas City, Mo.—Contracts for street improvements have been let as follows: Norton Bros., \$1,553.01; Ed. Meegan, \$2,635.10; Weaver Bros., \$361.50; Missouri Sidewalk Co. (4 jobs), \$178.44, \$118, \$183.20 and \$640.73; Reliance Construction Co., \$334.92; F. P. McCormick, \$2,680.53; Cleveland Trinidad Paving Co. (2 jobs), \$2,373.07 and \$347.70; J. O'Connor & Son, \$6,533.50; A. Jacks & Co., \$3,551.40; Weaver Bros., \$1,610.90; F. P. McCormick, \$984.20; D. T. Brosnahan (2 jobs), \$468 and \$971.10.

Livingston, Mont.—A paving contract in excess of \$50,000 has been let by the Warren Construction Co. and work is expected to start in about two weeks.

Missoula, Mont.—City has received bids on 6,600 yds. bitulithic pavement laid on a 5-in. concrete base and on 1,200 yds. gravel excavation as follows: J. C. McGuire, Butte, Mont., \$2.37 per sq. yd. for paving and 90 cts. per cu. yd. for excavation; total bid, \$21,252; M. F. Rohn Construction Co., Portland, Ore., \$255 for paving and \$1.25 for excavation, total bid \$23,592; G. H. Nash & Co., \$2.50 for paving and 90 cts. for excavation, total bid \$22,328. All bids included a 5-year guarantee.

Kearney, Neb.—Contract for constructing road 3,074 ft. long and 68 ft. wide has been awarded to John Beebe, Omaha, Neb., at \$1.95 per sq. yd. complete. Will require 22,547 sq. yds. vertical fibre brick, asphalt filter pavement and 5,165 cu. yds. grading.

Elko, Nev.—The Commissioners of Elko County have awarded a contract for the construction of the Secret Pass Rd., 16 miles from Halleck, to the Smith-Spraggin Co., Salt Lake City, Utah, at \$9,980.

Hackensack, N. J.—Contract awarded Uvalde Asphalt Pavement Co., 1 Broadway, New York, N. Y., for constructing road from Nutley bridge to Belleville Turnpike, at \$38,470.

Hoboken, N. J.—The contract for grading and repaving portions of Third, Fourth, Fifth, Sixth, Jefferson, Adams, Hudson, River and 14th St. and Willow Ave. has been awarded to the Uvalde Asphalt Paving Co., at \$42,040.

Perth Amboy, N. J.—Contracts for paving one block on Front St. and for curbing a portion of Compton Ave. have been awarded to Liddle & Pfeiffer and Graham & McKeon, respectively.

Albany, N. Y.—Contracts for paving various streets have been awarded by the Bd. of Contract and Supply as follows: State St. to John H. Cramond, at \$30,271.40; Bancker, Mercer, Peyster and Warren Sts. and Main, Park and Ryckman Aves. to Gleason & Davitt, at \$95,618.17; Quail St. to the Langan Construction Corp., at \$4,172.20; Dand St. to John H. Cramond at \$5,854; 3d St. to B. W. Mulderry at \$12,488.63; Glendale and Highland Aves. to Gleason & Davitt, at \$17,756.50; grading a portion of Eastern Park to Martin Murray & Co., at \$30,743.10.

Albany, N. Y.—Contract for building the main section, known as Part 1 and 2 of the Storm King highway, was awarded to-day to the John L. Hayes Construction Co. of Yonkers. The bid of the company was \$273,736.70, and was the lowest of those received. The section is 4.3 miles long. The contract for Part 3, which is 1.7 miles long, was awarded to Nardone & Patrillo of Mt. Vernon, N. Y., for \$13,341.90.

Binghamton, N. Y.—Bids were opened by the State Highway Department in Albany for repair work on Chenango River Rd. from the Binghamton City limits north, past the County Farm. The successful bidder was Charles E. Haney,

of Camillus, who submitted a proposal of \$12,690.40. The only other bidder was the Port Jervis Construction Co., which offered to do the work for \$13,386.85.

Endicott, N. Y.—The village board of trustees has awarded paving contracts to the Warren Bros. Co., of Boston, for bitulithic paving at \$2.22 per sq. yd. Portions of five streets are to be paved as follows: Broad St., Madison Ave., Genfield Ave., Monroe St. and Park St. The total cost is estimated at about \$33,000.

New York, N. Y.—Contracts have been awarded for improving portions of 38th St., 62d St., West End Ave., and 95th St., 36th St. and Amsterdam Ave. to the Asphalt Construction Co., 50 Church St., at \$66,386, \$17,923, \$12,017 and \$153,877 respectively.

Rochester, N. Y.—The contract for Primrose St. sewer, walks and grading, between Ridgeway Ave. and Knickerbocker St., has been awarded to James Passero for \$883.65.

Rochester, N. Y.—The contract for Denise St. cement walks, between McKinley St. and Grand Ave., has been awarded to the Oliver Costick Co. for \$452. That for Merchant's road walks, from Culver road to Lillac St., went to the Genesee Contracting Co. for \$1,414. The contract for Woodlawn St. brick pavement, Monroe Ave. to Pearl St., has been awarded to Whitmore, Rauber & Vicinus, for \$5,541.50. Warren Bros. were low bidders on Aberdeen St. asphalt pavement, Post Ave. to Woodbine St., but the bids were rejected. Warren Brothers' bid was \$10,869.

Rochester, N. Y.—Contracts for paving have been awarded as follows: Ribstein-Holter Co., at \$34,674, for paving North St. with brick; Rochester Vulcanite Pavement Co., at \$14,260.50, for paving Pinnacle road with asphalt, and to Flower City Contracting Co., at \$5,195.50 for paving Post Ave. with brick.

Schenectady, N. Y.—Contracts for paving nine streets with rock filled asphalt and concrete were awarded by the Bd. of Contract and Supply as follows: Six streets were awarded to the Schenectady Contracting Co. at \$48,047.40; 3 streets were awarded to the Union Paving Co. at \$10,108. The contract for furnishing 27,000 gallons of bituminous road materials was awarded by the Bd. of Contract and Supply to Barrett Mfg. Co., New York City, at \$2,227.50.

Yonkers, N. Y.—Following contracts have been awarded: Regulating, grading and improving Wilson Pl. from Chase Ave. to Morsemere Ave., O'Rourke Contracting Co., \$3,224.92. Regulating, grading and improving Adams Pl. from Chase Ave. to Morsemere Ave., O'Rourke, \$4,571.55. Regulating, grading and improving Park Ave. from Roberts Ave. to Greenvale Ave., O'Rourke, \$11,555.33. Regulating, grading and improving Tibbetts Rd. from Harrison Ave. to Springer Ave.; Hopper, \$6,448.30. Regulating, grading and improving Morsemere Ave., O'Rourke Construction Co., \$13,584.92. Regulating, grading and improving Chase Ave., William Hopper, \$17,088.

Spruce Pine, N. C.—Contract for constructing 8½ miles road 18 ft. wide has been awarded to C. D. Geer & Co., Rutherfordton, N. C., at \$19,000.

Bellevue, O.—The contract for improvement of the south end of the Anderson Bell Pike was awarded to M. R. Koffroth, Richwood, at \$9,560.

Columbus, O.—The following are the lowest bids received by Clinton Cowen, State Highway Commissioner, for the improvement of the following highways: Lima-Spencerville Rd., in Amanda and Spencer Twp., Allen Co., to M. O'Brien, at \$29,984. Ashland-Loudonville Rd., Vermillion Twp., Ashland Co., to D. A. Phillips, Ashland, at \$44,036; Hampden-Andover Rd., in Cherry Valley and Andover Twp., Ashtabula Co., to T. P. Fitzgerald, Ashtabula, at \$32,702; Athens-McArthur Rd., Alexandria Twp., Athens Co., All bids rejected. Barnesville-Hendrysburg Rd., Warren Twp., Belmont Co. Award withheld. Urbana-West Jefferson Rd., Union Twp., Champlain Co., to John D. Sheedy, Urbana, at \$3,415.92. Columbus-Sandusky Rd., Holmes Twp., Crawford Co., to Brady & Drake, Marion, at \$42,244. Steubenville-Cambridge Rd., Green Twp., Harrison Co., to J. P. Warnick, Cadiz, at \$15,374. Ada-Forest Rd., Liberty Twp., Hardin Co., to Sousley & Botkin, Ada, at \$12,274. Hillsboro-Greenfield Rd., Madison Twp., Highland Co., to S. M. Darby, Frankfort, at \$5,111. Milford-Hillsboro Rd., Liberty Twp., Highland Co., to Iron-

ton Transfer & Storage Co., Ironton, at \$4,486.04. Cincinnati-Chillicothe Rd., Madison Twp., Highland Co., to S. M. Darby, at \$7,756.99. Hillsboro-Washington Rd., Penn Twp., Highland Co. No bids received. Hillsboro-Piketon-Waverly Rd., Liberty Twp., Highland Co. No bids received. Mansfield-Norwalk Rd., Fitchville Twp., Huron Co., to Riley Pardo, Norwalk, at \$24,999. Ohio River Rd., Union Twp., Lawrence Co., to Brubaker Construction Co., Huntington, W. Va., at \$20,475. Canfield-Poland Rd., Canfield Twp., Mahoning Co., to E. J. Kane, Youngstown, at \$10,150.70. Marion-Waldo Rd., Waldo and Pleasant Twp., Marion Co. All bids rejected. Marysville-Marion Rd., Prospect Twp., Marion Co. All bids rejected. Middleport-McArthur Rd., Salisbury Twp., Meigs Co., to Jones & Miller, Patriot, at \$16,380. Piqua-Urbana Rd., Brown Twp., Miami Co., to Highway Construction Co., Elyria, at \$30,244. Woodfield-Marietta Rd., Center Twp., Monroe Co., to Ohio Valley Construction Co., Cincinnati, at \$2,115. Cincinnati-Dayton Rd., Van Buren Twp., Montgomery Co., to Strodtbeck Bros., Middletown, at \$62,595. McConnellsville-Athens Rd., Marion Twp., Morgan Co., to Frank J. Bontz, Columbus, at \$40,888. Zanesville-Caldwell Rd., Wayne Twp., Muskingum Co., to Seiple & Wolfe, Toledo, at \$26,400. Lancaster-Circleville Northern Rd., Circleville and Washington Twp., Pickaway Co., to Arthur M. Junk, Chillicothe, at \$32,957.44. Jackson-Piketon Rd., Beaver Twp., Pike Co., to Chas. V. Willis & J. W. Robinson, Waverly, at \$14,489. Cleveland-East Liverpool Rd., Edinburg Twp., Portage Co., to H. J. Neipfoot, Elyria, at \$23,981.91. Ravenna-Painesville Rd., Ravenna Twp., Portage Co., to Morgan Bros., Ravenna, at \$25,000. Edon-Richmond Rd., Jackson Twp., Preble Co., to Wroe Bros., Dayton, at \$31,900. Jackson-Portsmouth Rd., Clay Twp., Scioto Co., to W. H. Ringwald & Sons Co., Chillicothe, at \$43,084. Canton-Staubenville Rd., Osnaburg Twp., Stark Co., to Turnbull Bros. & Co., Canton, at \$51,084.37. Warren-Sharon Rd., Howland Twp., Trumbull Co., to Morgan Bros., Ravenna, at \$24,000. Urbana-Marysville Rd., Paris and Union Twp., Union Co., to Oather M. Junk, Chillicothe, at \$51,990. Van Wert-Rockford Rd., Pleasant Twp., Van Wert Co., to Isaac Putnam, Van Wert, at \$16,500. McArthur-Logan Rd., Swan Twp., Vinton Co., to Green & Gorman, Caldwell, at \$13,494. Chillicothe-McArthur Rd., Richland Twp., Vinton Co. All bids rejected. Bryan-Pioneer Rd., Pulaski and Jefferson Twp., Williams Co. Award withheld. Upper Sandusky-Findlay Rd., Crane and Salem Twp., Wyandot Co., to Modern Construction Co., Fremont, at \$30,900. Cleveland-Wooster Rd., Guilford and Montville Twp., Medina Co., to H. J. Neipfoot, Elyria, at \$1,655.24. Zanesville-Dresden Rd., Falls Twp., Muskingum Co., to A. Emery & Son, Zanesville, at \$13,600. Hamilton-Eaton Rd., Washington and Jasper Twp., Preble Co., to H. W. Curry Co., Eaton, at \$2,385.45. Dayton-Indianapolis Rd., Washington Twp., Preble Co., to H. W. Curry Co., Eaton, at \$1,865.52. Fremont-Port Clinton Rd., Rice Twp., Sandusky Co., to H. J. Neipfoot, Elyria, at \$1,262.36.

Walla Walla, Wash.—Bids have been received on 7,600 yds. paving, 4,400 ft. combined curb and gutter and excavation, as follows: T. B. Bidwell, \$1.60 per sq. yd. for 4-in. concrete base and 2-in. asphaltic concrete top; \$1.50 for same base and 1½-in. top; \$1.35 for 3-in. bituminous concrete base and 1½-in. asphalt concrete top; \$1.50 for 6-in. plain concrete; 68 cts. per ft. for combined curb and gutter; 98 cts. per ft. for armored curb & gutter; 50 cts. per cu. yd. for excavation; 35 cts. per ft. for plain curb. Warren Construction Co., \$1.42 per sq. yd. for 4-in. gravel bitulithic; 65 cts. for combined curb and gutter; 90 cts. for armored curb and gutter; 50 cts. for excavation; 30 cts. per lin. ft. for plain curb. H. L. Wilson Co., \$1.40 per sq. yd. for 4-in. concrete base and 2-in. asphaltic concrete top; \$1 for 3-in. bituminous concrete base and 1½-in. asphaltic concrete top; 59 cts. for combined curb and gutter; 79 cts. for same armored; 48 cts. per cu. yd. excavation; 30 cts. per lin. ft. for plain curb.

Pittsburgh, Pa.—Contracts for paving 6 roads have been awarded as follows: J. Toner Barr for Noblestown road, 500 ft. brick at \$3,011; McCrady Bros. for Braddock & Ardmore road, 0.31 mile, with brick, at \$7,086; James Sweeney for Newton and Rodi road, 0.74 mile, with brick, at \$25,568; D. W. Challis & Sons, for McCoy extension road, 1.25

miles with macadam at \$17,669; R. H. Cunningham & Sons Co., for Wilmerding and Monroeville connecting road, at \$25,204, and to Wm. J. Payne, Jr., Co., for Millers Run extension road, 2 miles long, with brick, at \$42,472.

Knoxville, Tenn.—Following contracts for road construction have been awarded: To R. L. Peters & Co., Brabson's Ferry, 5.70 miles, \$12,809.50; Boyd's Bridge and Thorn Grove, 2.06 miles, \$8,682.50; Graveston, 2.54 miles, \$7,522; Martin Mill, 1.32 miles, \$4,376; Mascot-Straw Plains, 2.39 miles, \$9,139.50; Neubert Springs, 1.54 miles, \$5,933.25; Picken's Gap, 3.39 miles, \$10,317.60; Park City-Boyd's Bridge, 2.06 miles, \$7,943; Ruggles Ferry, 7.25 miles, \$21,392.50; Rutledge Rd., 2.25 miles, \$8,079.25; Sevierville Rd., 8.00 miles, \$25,113.50; Thorn Grove extension, 1.16 miles, \$6,350; Thorn Grove and Carters, 1.77 miles, \$8,311.50; Young's school, 0.77 mile, \$2,607.80. Total miles 42.20, \$128,677.80. To Donovan, Doughty & Taylor: Central Ave. to Raccoon Valley and Hellsell, 7.77 miles, \$22,386.50; Middlebrook and Cedar Bluff, 6.42 miles, \$25,928.35; Concord Rd. to county line, 4.25 miles, \$15,707.01; total miles 18.44, \$64,021.86. To Dykes & Co.: Link, Fountain City to Broadway, 1.00 mile, \$5,111.90. To J. A. Kreis: Broadway, Smithwood to Hall's Cross Roads, 4.81 miles, \$14,393.25; Dry Gap, Central Ave. to Pedigo, 8.31 miles, \$20,986.50; total miles 73.76, \$243,191.31.

Corpus Christi, Tex.—Contract has been awarded to the Texas Bitulithic Co. for paving with bitulithic 86,000 sq. yds., at approximately \$258,000. Of the amount, the city will pay one-fourth and the remaining three-fourths will be paid by street railway company and property owners.

Dallas, Tex.—Contract for paving Zang's Blvd., from Bishop to Cantez St., has been awarded by the Board of City Commissioners to the Vibrolithic Co. at \$1.75 per sq. yd. The city's share of the improvement is \$11,867.82 and that of the property owners \$12,747.68, a total of \$24,615.50.

El Paso, Tex.—An ordinance has been adopted awarding the contract for the paving of California St. from Mesa Ave. to Los Angeles St., to the Southwestern Paving Co.

Ogden, Utah.—A contract for paving in Dist. No. 11 has been awarded to the J. P. O'Neil Construction Co., Ogden, at \$4,163.

Norfolk, Va.—A contract for paving certain streets has been awarded to Louis Lauson, Norfolk, at \$32,992. Other bids were: Atlantic Bitulithic Co., \$40,112; F. J. McGuinn, \$40,062; Continental Public Works Co., \$35,128; Central Contracting Co., \$35,127.

Portsmouth, Va.—Contract has been awarded to O. L. Williams for grading West Norfolk road for a distance of four miles at the rate of \$50 per mile. The Dalby-Nottingham Co. submitted bid for the work at \$97.50 per mile. The work is to be done under the supervision of the road commission's engineer.

Green Bay, Wis.—A contract for paving various streets has been awarded to William Pickett, 1200 Doty St., Green Bay, at \$10,400. Other bids were: Murphy Construction Co., \$11,400; Carlin Bros., \$10,977.

Niagara Falls, Ont., Can.—Contract awarded to C. H. Kaumeir, of Welland, for paving Queen St., at \$9,245.90. Other bidders were McRae & Campaign, \$10,359.25. Contract was awarded to C. H. Lorenzo of this city for paving Roberts St., at \$4,214.82. Other bids were: McRae & Campaign, \$10,133.42; W. J. Spencer, \$4,933.90; McPherson & Thomas, \$5,830.60; C. H. Kaumeir, \$5,174.11.

SEWERAGE

Birmingham, Ala.—Council has adopted ordinance providing for construction of certain sanitary sewers in North Birmingham.

Los Angeles, Cal.—Council has passed ordinance of intention to construct sewers in Montecito St., between Agate and Clifton Sts., in Eighth St., between Wilton Pl. and Norton Ave., and in Henry St., between Griffen Ave. and May St.

Pomona, Cal.—Council has authorized Mayor to secure bids for construction of concrete storm sewer.

Stockton, Cal.—Council has adopted plans and specifications for storm sewers on parts of Maple, Elm, North Commerce, North Center and North El Dorado Sts.

Bridgeport, Conn.—Sewer committee recommends construction of sewer in Brothwell St. and sewer system for Black Rock section of city.

Wallingford, Conn.—Following bids have been received by borough for construction of 24-in. tile line, pipe and crushed stone being furnished by the borough: O'Neill Bros., Hartford, \$5,647.50; N. C. Lascino, Hartford, \$7,251; E. F. Kavanaugh, Wallingford, \$7,726; Thos. F. Mohr, New Haven, \$9,107.50; Berdino & Tomsetto, Meriden, \$9,492.50.

Alton, Ill.—City is considering construction of storm sewer to carry flow in Prasa St. Plan of enclosing creek is also under consideration.

East St. Louis, Ill.—East side levee and sanitary district has authorized bond issue of \$600,000, proceeds to be used in carrying out general plan of sanitation.

Galesburg, Ill.—Petitions for construction of several sewers have been presented to council.

Muncie, Ind.—City Council is considering plans for building sewer to serve residents of Industry and Congersville. The sewer will probably be 5 ft. in diameter at the outlet and estimated cost is \$50,000.

Ames, Ia.—City is planning sewer system, including about 5 miles of mains and laterals.

Keokuk, Ia.—Council has passed ordinance of intention to construct 8-in. sanitary sewer. Hearing will be held Aug. 23.

Muscatine, Ia.—City will construct storm water sewer and several sanitary sewers. Engineer now preparing plans and estimates.

Muscatine, Ia.—Sewerage improvements approximating \$10,000 in cost may be made in the city during the late summer and fall. At recent meeting of the City Council the preliminary plans and schedules for sub-sewerage district No. 31, of main 1, and sub-sewerage district No. 5, of main 3, as submitted by the city engineer, were approved. The former district extends along 11th St. from Iowa Ave. to Fuller St., while the latter includes East Fourth St. from Mad Creek to Park Ave., as well as Beggs, Munn and Lee Sts. on East Hill.

Pittsburgh, Kan.—Bid for the construction of a sewer in the alley west of Joplin from 14th to 15th were above the engineer's estimate and were rejected. The city will readvertise.

Paducah, Ky.—Bids have been received for construction of outfall section of sewer district No. 3. Five contractors put in bids for both brick and concrete. Yancy & Johnson, of Paducah, only bid on brick, their total being figured at \$49,361.68. The Winston Bros. Co., of Minneapolis, bid only on concrete, their total being \$45,834.40 which is \$2,000 less than the lowest estimate made by the city. The five contractors having bids for both materials are: Michael & Minnick, Marion, Ind.; L. N. Hancock & Co., Louisville; Hickey Bros., St. Louis; James Ferry & Son, Baltimore, and Houghlan & Paul, Dayton, O.

Maryland.—State Board of Health has granted following permits: Chestertown, lateral sewer extensions and extension of water distributing system; Takoma Park, lateral sewer extensions; Maryland Agricultural College, sewage disposal plant; Maryland State Normal School, sewage disposal plant; Preston, lateral sewer extensions; Betterton, sewerage system and disposal plant; Ocean City, permit to issue \$12,000 bonds for sewer construction.

Delmar, Md.—Town has been ordered by State Board of Health to submit plans and specifications for sewerage system and disposal plant.

Rockville, Md.—The Commissioners of Montgomery county are having plans and specifications prepared for a sewerage system and sewage disposal plant in the Little Falls Branch drainage area, in conformity with the recently published report of the State Board of Health, concerning sewage collection and disposal in the vicinity of the District of Columbia, and in compliance with the order of that board. The preliminary estimated cost is about \$125,000.

Towson, Md.—Sewerage system and disposal plant are proposed at Towson. Preliminary estimated cost is about \$40,000.

Pittsfield, Mass.—City has decided to lay a sewer in Plinn St. from Maloney St. to Robert St. and to lay a water main in North St. from Fairview Ave. to Cromwell Ave.

Pittsfield, Mass.—Bonds in sum of \$100,000 have been sold to Merrill,

Odaham & Co., Boston, at \$101,349. Proceeds of sale will be used for construction of sewerage system.

Fenton, Mich.—Council has reconsidered action in awarding contract to Whaley & Edwards of Milan for construction of sanitary sewer system and will advertise for new bids.

Saginaw, Mich.—City will shortly issue \$10,000 bonds to defray expenses of constructing sewers.

St. Joseph, Mich.—Following is a list of the sewers that will be improved with the money to be derived from the proposed \$600,000 sewer bond issue. Fifty thousand dollars will probably be used to construct the Brookdale flood reservoir, and the remainder would be divided among the following sewers: Brown's branch, from city limits to city limits, including channel connecting it with Arthur's branch; lower Whitehead main sewer from Second to Fifth Sts., and from Seventh to Sixteenth Sts.; upper Whitehead main sewer from Ninth to Twenty-second Sts.; extension to Parnell Pl. sewer; extension of South Park sanitary sewer to Twenty-eighth St.; extension of upper Whitehead main sewer from Twenty-second St. north-east; extension of Oak Hill main sewer east, Oak Hill to Mason Pl., Oak Hill to Messanie St., Oak Hill to Shaw and Kilby's addition; extension of Brookdale main sewer across Eby Land Co.'s addition to Thirty-second St.; extension of Blacksnake main sewer to Karnes road; Roy's branch main sewer improvements; extension of Grand Ave. main sewer east of Twenty-second St., with forks both north and south; extension of Grand Ave. sewer northeast at Fifteenth St., ending at Moss St.

Atlantic Highlands, N. J.—City will probably extend sewers into several streets and may construct sewage lifts.

Camden, N. J.—Council has passed an ordinance authorizing the construction of sewers and drains in and along Carmen St. and in Watson St.

Newark, N. J.—Bids were received July 29 by the city for the construction of the Bound Brook and Frelinghuysen Ave. sewer from O'Gara & Maguire, Newark, \$33,175; Averill Mathews Co., Montclair, \$36,377; John W. Heller, Newark, \$37,956; P. L. Braunwith, \$38,164; Frisco Construction Co., Newark, \$39,295; Harrison & Craig, Newark, \$44,930; P. D'Anato, Newark, \$53,194; Charles Ippolito, Montclair, \$76,661.

Newark, N. J.—City contemplates the building of storm sewer in Hollywood Heights section of Hillside.

Newark, N. J.—City will soon construct sewer 800 ft. long in Hamburg Place.

Passaic, N. J.—Council has passed ordinance ordering laying of sanitary sewer 8-in. in diameter in and through Oak St.

Perth Amboy, N. J.—Council has ordered laying of 8-in. sewer in Front St. from Market to Gordon Sts.

Plainfield, N. J.—Ordinance is before Council for construction of 8-in. sewer in Euclid Ave.

Trenton, N. J.—City has authorized construction of sewer, payment for which will be made from bonds to be issued by city.

Binghamton, N. Y.—Council has ordered city engineer to proceed with surveys and plans for intercepting sewerage system and disposal plant and report to Council; also ordered construction of sewers in several streets.

Brockport, N. Y.—Village Board has received report from C. C. Hopkins, consulting engineer on sewage disposal plant. Estimate of cost is \$28,500.

Newburgh, N. Y.—Two hearings on propositions to build sewers in city streets will be held August 19. In case it is decided to build sewer in Mill St., bids will be opened and contract awarded at the adjourned meeting.

Syracuse, N. Y.—Bids have been received for construction of northeast storm water sewer. Frank S. Sposoto was low at \$34,315. Other bidders were Frank George White Plains, \$38,984; John C. Schrade, Brooklyn, \$40,962.50; Samuel Bonn, \$42,419.25; the Whiting-Turner Co., Baltimore, \$42,522.05; C. T. Hookway Construction Co., \$44,637; Mondo Construction Co., \$44,980; Chas. Bonn & Nicholas Marnell, \$45,234.50; James F. Leary Construction Co., Rochester, \$49,592.

Utica, N. Y.—City is contemplating construction of sewers in Auburn and Thorn Aves. and Van Vorst St. Plans are filed.

White Plains, N. Y.—Seven bids have

been received for laying of sewer in Independence St. They were from Petro Luciano, Joseph DeMarro, William A. Neilly, Toro Paradiso, Frank Cestone and Edward Jackson.

White Plains, N. Y.—The Village Engineer has been directed to prepare plans and specifications for the laying of an 8-in. lateral sewer in Sixth St. and Primrose St. The sewer will be about 1,000 ft. long, and will run from Battle Ave. to Chatterton Ave.

Yonkers, N. Y.—Secretary of Board of Contract and Supply has been directed to advertise for bids to be received by the board at its next meeting, Aug. 16, on the following jobs: Construction of house and storm water sewers in the Saw Mill River Rd. between Lockwood Ave. and Palmer Rd.; in Glover Ave., from McLean Ave. to Scott Ave.; in Alexander Ave., between McLean and Scott Aves.; in Sterling Ave., from McLean Ave. 400 ft. northerly; in Woodlawn Ave., between McLean and Wakefield Aves.; the regulating, grading and otherwise improving of Briggs Ave., from Lockwood Ave. to the southerly line of the Mitchell estate; the construction of the Hawthorne and Warburton Ave. sewer outlet and the extension of the Wells Ave. sewer outlet; the construction of house sewers in Wakefield Ave., from the Bronx River Rd. to Hyatt Ave.; in Hyatt Ave., from Wakefield Ave. to Scott Ave.; in 1st St., between Scott and Wakefield Ave.

Geneva, O.—Two petitions for sewer construction have been presented to the council and are being considered by committee.

Mansfield, O.—Council has voted to lay 10-in., 12-in. and 15-in. sewer in several streets. An 8-in. lateral sewer will also be constructed.

Mansfield, O.—Council has declared it necessary to improve sewer district No. 1 by constructing 10-in. and 12-in. sanitary sewers and 15-in. trunk sewer. Plans and specifications have been prepared by city engineer and are on file with Department of Public Service.

Niles, O.—Board of Health has demanded that City Council proceed at once with construction of a trunk sewer from Federal St. bridge to Mahoning River. Plans have been completed by city engineer.

Niles, O.—City has ordered immediate construction of trunk sewer from Federal St. to Mahoning River.

Youngstown, O.—Council has declared it necessary to construct sewer in Hartford Ave. from Mahoning Ave. to Connecticut Ave., in Poplar Ave. from Berlin to Calvert Sts. and in Hamburg St. from Poplar Ave. to Federal St.

Eugene, Ore.—City will shortly extend mouth of sewer into river so as to do away with nuisance at low water.

Portland, Ore.—Alexis Contract Co. was low bidder at \$21,106, for the construction of a sewer in E. Alder St., extending from E. Second St. to the Willamette River.

Ambridge, Pa.—Following bids have been received for laying 600 ft. 24-in., 600 ft. 12-in. tile and 24,000 ft. 48-in. terra cotta sewer: R. E. Baldwin, \$1.03 per ft. for 24-in., 68 cts. per ft. for 12-in., and \$5.42 per ft. for 48-in. terra cotta; G. S. McFall, \$1.28, 65 cts. and \$4.90; S. B. Markley, \$1.50, \$1 and \$6; J. G. McGuire & Co., \$1.60, 95 cts. and \$6.75. Rock excavation allowed extra at \$2 per yd; manhole covers, \$8.50.

El Paso, Tex.—Petition has been presented to the Council asking for extension of sewers.

Richfield, Utah.—Citizens have voted bonds to extent of \$25,000 for purpose of constructing sewer system. Bonds will run 20 years.

Hurlington, Vt.—Petition before council for construction of sewer in Adams St.

Berkley, Va.—An appropriation of \$4,300 to extend the Hardy Ave. sewer through Fauquier St. to deep water has been ratified and a further appropriation of \$5,700 was recommended to run the sewer from Fauquier St. through Bellamy Ave. to Main St. to be emptied into deep water at the foot of Main St. This last measure will be presented to the Councils at their next meeting for final ratification.

Sheboygan, Wis.—Board of Public Works has recommended construction of 12-in. and 10-in. sewers in several streets.

CONTRACTS AWARDED.

Sacramento, Cal.—A. Teichert & Son have been awarded contract by city for

construction of Unit No. 6 of the new sewer system for \$71,476.

Santa Barbara, Cal.—Contract awarded to J. W. Eggert & J. Ukropina, Los Angeles, Cal., at \$20,717 for constructing about 8 miles of sewer from 6 to 12-in. pipe.

Stockton, Cal.—Contract for laying 48-in. storm sewer on East St. was awarded to Leach & De Court for \$3,711.82. The estimate of the city engineer was \$4,051.50.

Galesburg, Ill.—Following bids were received Aug. 6 for construction of North West St. sewer: D. E. Keeler Co., Davenport, Ia., total bid \$25,224.50, awarded contract. Unit bids as follows: 30-in. sewer, \$2.78 per ft.; 24-in., \$1.83; 18-in., \$1.37; 12-in., 88 cts.; 10-in., 69 cts.; manholes, \$33; catch basins, \$28. Other bidders on same materials were: Henry Rees, Quincy, Ill., total bid \$25,537.28. Items, \$2.80, \$1.90, \$1.24, 90 cts., 63 cts., \$30, \$28; A. C. Schreiter, Manitowoc, Wis., \$25,993.20. Items, \$2.96, \$1.63, \$1.26, \$1.06, 73 cts., \$30, \$30. E. R. Harding Co., Racine, Wis., \$27,165.16. Items, \$3.50, \$1.85, \$1.15, \$1, 70 cts., \$34, \$34.

Joliet, Ill.—The Board of Local Improvements and the City Council, Mr. Odenthal city clerk, let contract to Robert Shannon, at \$90,384.95, for the third ward sewer.

Peoria, Ill.—Contract for constructing sewer system has been awarded to E. R. Harding Co., Racine, Wis., at \$202,824.50.

Princeton, Ind.—The Nappanee Drainage Co. has received the contract for construction of the 8-mile Claymeier drainage ditch in Barton Township for \$21,999, and also for the extension of the ditch in Warrick County for \$1,450. There were fifteen bidders.

Clinton, Ia.—Contract has been awarded to Thomas Carey & Sons for construction of three and a half blocks of sewer in Ridgewood at \$1,305. There were no other bidders.

La Porte City, Ia.—Contract awarded to Bash & Jones, Joplin, Mo., at \$11,751.51 for laying 8-in., 10-in., 12-in., and 15-in. vitrified sewer pipe. Itemized bids are as follows: Bash & Jones, 10,496 ft. 8-in. at 32 cts., 3,689 ft. 10-in. at 45 cts., 3,955 ft. 12-in. at 50 cts., 4,820 ft. 15-in. at 65 cts., 54 manholes at \$35, 13 flush tanks at \$65. Other bidders were: Moore-Sleg Construction Co., Waterloo, Ia., \$12,882.98; Dearborn Construction Co., Waterloo, Ia., \$13,520.13; M. S. Jackson, Cedar Rapids, Ia., \$14,008.20.

Norton, Kan.—Following bids have been received on sewer construction: Gordon & Taylor Construction Co., Denver, Colo., \$32,149.35; M. W. Holbein, Attica, Ind., \$32,489.19; T. M. Forson, Kansas City, Kan., \$38,442.63; W. W. Cook, Junction City, Kan., \$35,957.67; O'Neill Construction Co., Leavenworth, Kan., \$34,103.97.

Topeka, Kan.—James A. Pringle, city, at \$125,835, awarded contract by City Commissioners for the construction of the east side sewer.

Baltimore, Md.—The contract for the construction of Section No. 1 of the Jenkins Run trunk drain, storm water contract No. 45 has been awarded to Slack & Slack, Baltimore, at \$81,742. Other bids were: Whiting Turner Construction Co., \$84,999; C. B. Clark & Co., \$88,418; Ryan & Reilly, \$90,069; Continental Contracting Co., \$92,404; Janon Fisher, \$93,434.

Ocean City, Md.—The Boyle, Lohmuller Contracting Co., Calvert Building, Baltimore, at \$14,297, awarded contract by city for installation of intercepting sewer and construction of clarification tank and pumping station.

Boston, Mass.—Bids were received July 28 by the Metropolitan Water and Sewerage Board for the construction of (a) Section No. 105, (b) Section No. 106 of high level sewer, South Metropolitan System in Needham and Wellesley, from Hugh Nawn Contracting Co., Roxbury, (a) \$29,655 (awarded contract), (b) \$27,912 (awarded contract); George M. Ryne, (a) \$37,272, (b) \$43,315; Coleman Bros., (a) \$44,230, (b) \$37,651; Michael McMan, (a) \$52,187, (b) \$44,605; Henry Solmich Contracting Co., (a) \$52,493, (b) \$43,630; M. Russo & Son, (a) \$54,162, (b) \$53,047; Bruno & Pettiti, (a) \$58,385, (b) \$61,685.

West Roxbury (Boston), Mass.—Wm. L. Dolan secured contract, at \$5,700.85, for sewerage work in Jamaica Way, Park-

ton road, Moraine St., Pondview Ave., and Halifax St., West Roxbury.

Alma, Mich.—Thomas Sampson, of Mount Pleasant, has been awarded contract at \$6,090, for sewer for Gratiot, Woodworth and the Rockingham Division to Ely St.

Escanaba, Mich.—John F. Lindsay, city, at \$33,271, awarded contract for extension to present sewer system.

East Grand Rapids, Mich.—Contract for installing sewer system to cost about \$50,000 and including disposal plant, has been awarded to Albert H. Prange, Lake Driver, Grand Rapids, Mich.

Fenton, Mich.—At special meeting held July 30, Council awarded contract for sanitary sewer system to Whaley and Edwards of Milan, though their bid was \$1,400 higher than low bid.

Lake Linden, Mich.—McDonald Bros., of Hubbell, secured contract for the installation of the new village sewer system.

Marshall, Minn.—Hector Coolsaet, city, at \$9,038, for ditch No. 15, and Anderson & Arthur, Tracy, Minn., at \$55,600, for ditch No. 16, awarded county ditch jobs from bids opened July 26.

Virginia, Minn.—The Eveleth Construction Co., of Eveleth, Minn., has been awarded contracts for the construction of two storm sewers in the alley on Chestnut St., for \$27,011.

Wisner, Neb.—Arthur A. Dobson Co., Lincoln, Neb., secured the contract at \$14,510, for sewer system for Wisner.

Maywood, N. J.—The contract for the construction of a sanitary sewer system has been awarded to Martin-Miller & Pizzimenti, Caldwell, at \$87,911. Other bids were: Frisco Construction Co., Newark, \$94,131; Di Napoli & Toriella Construction Co., \$96,458; E. C. Humphrey, \$127,280.

Millburn, N. J.—Commissioners of Millburn Township let contract to John Dorer, Irvington, N. J., for 8-in. vitrified tile sanitary sewer in Prospect Ave.

Passaic, N. J.—Contract for laying sanitary sewer in Daniels Ave. has been awarded to J. A. Sammis for \$1,005.15.

New York, N. Y.—D. J. Donnell, city, at \$10,926, awarded contract for alteration and improvement to sewer in 32d St., between Broadway and Fifth Ave., Borough of Manhattan.

Wilmington, N. C.—The bids for building the culvert at Macomber's ditch were received as follows: W. L. deRosset, \$4,005.10; A. D. O'Brien, \$4,503.08; J. B. Davis, \$3,699.60; F. M. Abeel, \$3,546.55; W. N. Royal, Rocky Mount, \$2,790.60 (awarded contract).

Aberdeen, N. Dak.—The Arthur A. Dobson Co., of Lincoln, Neb., has been awarded contract by City Commissioners for the completion of the First Ave. sewer for \$24,027.

Ashtabula, O.—Contract for constructing sewer system has been awarded to Hukari & Koski, Ashtabula Harbor, O., at \$3,931.45.

Cheviot, O.—Contracts for sewer construction have been awarded to James McLain, Newport, Ky., for constructing a trunk drain in Powells Track, and to A. Boerson, Cincinnati, for constructing a trunk drain in the Schlenker and Reubel property.

Cincinnati, O.—The contract for the construction of Poague Ave. sewer has been awarded to Runk Bros., at \$5,701.

Hamilton, O.—Contract for the second half of the sanitary sewer work in East Hamilton has been awarded to the H. C. Smith Co., of Dayton.

Harrisburg, Pa.—M. M. Sheelsley & Son, Johnstown, at \$7,359, awarded contract for construction of reinforced concrete sewers in Brookwood, Bolton, Dunkle, Derry and 30th Sts.

Sheboygan, Wis.—Board of Public Works has awarded contract for constructing sewer on Union Ave. to E. Aldag, Jr., at \$575.45.

Whitewater, Wis.—A. M. Lanvon has secured contract, at \$23,900, for construction of sewerage system.

WATER SUPPLY.

Washington, D. C.—American consular officer in Canada reports that City Council in his district has authorized the city engineer to purchase water meter and that several hundred will probably be bought in the near future.

Pensacola, Fla.—Bids have been asked on furnishing and laying a high pressure main for the aeronautical station. Air compressor with capacity of 3,000 pounds will be installed soon.

Clinton, Ill.—City has decided to build new waterworks reservoir.

Galesburg, Ill.—Petitions for extension of water mains have been presented to council.

Paris, Ill.—City has rejected bids received on July 22 for the construction of a rapid sand filtration plant. The lowest bid was \$20,979.

Paris, Ill.—City Council rejected all bids for filtration system. No new bids will be asked at present.

Indianapolis, Ind.—Water mains have been ordered laid by the Board of Public Works in the following streets: Beechwood Ave., from Audubon Rd. to Burgess Ave.; Hemlock Ave., from Fairfield Ave. to Fall creek parkway; Gale St., from New York to Ohio Sts., and Ohio St., from Gale St. to Woodland drive.

Spearville, Kan.—At recent election citizens voted to issue bonds in sum of \$25,000, proceeds of which will be used in construction of water system.

Maryland.—Following water permits have been granted by State Board of Health: Chestertown, extension of water distribution system; Annapolis Water Co., installation of liquid chlorine plant; Piedmont Waterworks Co., installation of liquid chlorine plant at Bloomington; Sherwood Forest Co. (Anne Arundel county), construction of tubular wells for water supply; West-ernport, supply pipe line to distributing reservoir.

Haverhill, Mass.—City will shortly lay 765 feet 6-inch water mains and other short sections.

Penbody, Mass.—The Commission of Public Work has opened bids for remodeling the old pumping station as follows: J. D. Jeffers, \$1,272.45; F. F. Bommer, \$1,322; M. E. Kelley Co., \$1,475; E. H. Porter Co., \$1,495; George F. Rouse, Salem, \$1,782. The bids required certified checks to accompany them, and there were none with the two lowest. The matter was laid on the table, no award being made.

Sterling, Mass.—Meeting of town will be held August 14th to see if town will vote to raise and appropriate sum of \$30,000 to construct water supply system.

Saginaw, Mich.—City will vote about Oct. 1 on water works proposition.

Duluth, Minn.—Gas and water mains will be ordered in Otsego St. from 51st to 54th Aves. east.

Adams, Neb.—A special election was held Aug. 10 to vote on the proposition to issue \$15,000 of bonds for a water works system.

Lima, O.—Proposition before Council to construct reservoir with capacity of a billion gallons of water; estimated cost of project is \$300,000. Conference held Aug. 6.

Newark, O.—City will soon advertise for installation of additional filtration units.

Sylvania, O.—Bids will be received until noon, Aug. 30, for bonds in sum of \$22,000, proceeds of which will be expended in construction of waterworks, pipe system, etc.

Youngstown, O.—Council has authorized Director of Public Service to enter in contract for completing filter plant and rebuilding old filters.

Grove, Okla.—An election was held Aug. 9 to vote on the proposition to issue \$10,000 of bonds for water works and electric light extensions.

Tamaqua, Pa.—The Commissioners of Water Works have decided to advertise for bids for the construction of a dam at Owl Creek to hold about 357,000,000 gallons. The breast of the dam will be about 30 ft. deep. The cost will be between \$92,000 and \$97,000. The new reservoir will be built about 1,000 ft. above the present reservoir. In order to pay for this improvement it has been decided to enter into a contract on the deferred payment plan, which provides for so much each year for a term of years.

Bristol, Tenn.—City is considering project of concreting Mumpower reservoir in order to prevent waste by leakage and to make cleaning easier.

Ogden, Utah.—City has granted petition for water main extensions.

Keyser, W. Va.—City votes Aug. 10 on \$35,000 bonds to extend water works, construct sewer in bed of New Creek to dispose of sewerage of city proper and purchase fire truck. Address the Mayor.

Keyser, W. Va.—City has voted bonds to extent of \$25,000, proceeds of which will be used to construct waterworks.

Leander Schardt, Cumberland, Md., is engineer.

Seattle, Wash.—Council has passed resolution for improving 43d Ave. from East 33d St. to East 45th St. by constructing water mains and setting hydrants.

CONTRACTS AWARDED.

Phoenix, Ariz.—Chas. C. Moore Engineering Co., of San Francisco, at \$4,475, and the Pittsburgh-Des Moines Steel Co. at \$3,240 awarded contracts for installing water tube boiler and steel tower and tank at the Asylum, State Prison and State House.

Corning, Cal.—Contract for constructing waterworks system has been awarded to S. A. Wheeler at \$4,745.75.

Clayton, Del.—Contract for installing waterworks, sewer and sewage disposal plant has been awarded to Ambler-Davis Co., 1016 Harrison building, Philadelphia, Pa., at \$18,284.

Chicago Heights, Ill.—Bids for furnishing a deep well pump were received as follows: The Hill Trip Pump Co., Anderson, Ind., \$2,300, less \$200 for old pump; The Layne & Bowler Corp., Los Angeles, Cal., \$2,575, less \$1,175 for old pump (awarded contract); The American Well Works, Aurora, Ill., \$2,240.

Rockford, Ill.—Following bids were received on pumping equipment: Rotary type—Layne & Bowler Corp., Los Angeles, Cal., Proposal No. 1, \$4,882; American Well Works, Aurora, Ill., \$5,739; Layne & Bowler Corp., Proposal No. 2, \$5,782; Byron Jackson Co., San Francisco, Cal., \$5,833. Reciprocating type—American Well Works, Aurora, Ill., \$9,600; International Steam Pump Works, Chicago, \$9,900. Contract awarded to Layne & Bowler.

Grinnell, Ia.—To Bash & Jane, Joplin, Mo., at \$9,735.51, for water works extension for Grinnell.

Ogden, Ia.—Contracts for water works extension have been let as follows: General construction, Alamo Engine & Supply Co., 1122-24 Farnam St., Omaha, Neb., \$9,387; concrete reservoir, Boone Construction Co., Boone, Ia., \$2,406. R. B. Reasoner, Engineer, Des Moines, Ia.

Covington, Ky.—The contract for pipe trenching and back filling for 10,950 ft. of 24-in. water mains has been awarded to the United States Cast Iron Pipe & Foundry Co., Chicago, Ill., at \$92,000.

Covington, Ky.—U. S. Cast Iron Pipe and Foundry Co., Addyston, O., secured contract from city for supplying 2,000 tons of 24-in. cast iron pipe for the construction of the emergency main from the Ft. Thomas reservoirs to Covington. Pipe will cost about \$92,000.

Portland, Me.—Contract for building new concrete dam across Presumpscot River has been awarded to H. P. Cummings Construction Co. of Ware, Mass., at approximately \$40,000.

Kansas City, Mo.—Contract has been awarded to the Bodger Meter Manufacturing Co. of Milwaukee, Wis., for furnishing 2,000 1/2-in. water meters.

Wibaux, Mont.—The contract for the construction of a water system has been awarded to the Hoggart Construction Co., Fargo, N. D., at \$24,500. C. H. Green, Spokane, Wash., is consulting engineer.

Binghamton, N. Y.—The Board of Water Commissioners has awarded the contract for the construction of a reservoir on South Mountain to Barilly & Ingersoll, at \$20,032. Other bidders were: Frank Stento, \$42,598; H. R. Porterfield, \$21,700. H. B. Sproul, \$29,203; W. H. Genegan, \$23,869; J. F. Leary Co., \$31,165; J. W. Gummo, \$33,768; Williams & Richardson, \$33,503.

Hilton, N. Y.—The following contracts have been awarded for the construction of a water system: Pipe and specials, United Cast Iron Pipe & Foundry Co.; valves and hydrants, Ludlow Valve Co.; elevated water tank, Chicago Bridge & Iron Works; general contract, M. Applegate & Son, Bradford, Pa.

Hilton, N. Y.—M. Applegate & Son, Bradford, Pa., at \$17,808, awarded contract for installation of waterworks system. Pipe will be furnished by U. S. Cast Iron Pipe & Foundry Co. and valves by Ludlow Valve Co. H. C. Kittredge, engineer, Rochester.

Walden, N. Y.—Contract has been awarded to Campbell & Dempsey, of Kingston, for constructing 70-ft. brick chimney at pumping station. Contract awarded to Rider-Ericson Engine Co., for installing new 125 h.p. boiler.

Hillsboro, N. D.—Following bids have been received by city for laying 1,006 ft. 6-in. water pipe and setting 3 hy-

drants: Carrol Bros., Grand Forks, \$0.98 per ft. for laying pipe, \$20 each for valves and \$45 each for setting hydrants; total bid, \$1,151.60 (awarded contract); Robinson Van Alstine, \$1.05 per ft. for pipe, \$20 for valves and \$60 for hydrants; B. H. Boswood, \$1.07 for pipe, \$18 for valves, \$60 for hydrants; Grand Forks Concrete Co., \$1.05 for pipe, \$18 for valves and \$60 for hydrants.

Cincinnati, O.—The contract for laying water mains in connection with the high pressure fire service has been awarded to the Kirchner Construction Co., Cincinnati, at \$13,555. Other bidders were: M. J. McCarthy, \$14,427; T. P. Strach, \$16,621; H. V. Conneley, \$17,252; M. F. Quill, \$18,047.

Linn, Ore.—The contract for the construction of water works in West Linn has been awarded to the Oregon Engineering & Construction Co., Oregon City.

Altoona, Pa.—G. W. Ellis, city, has been awarded contract by Borough for approximately 13,000 ft. of water main from the Homer Gap reservoir to the city line for \$0.31 per lin. ft. The pipe will be supplied by the U. S. Cast Iron Pipe & Foundry Co.

Canova, S. D.—The contract for the construction of a water system has been awarded to the Des Moines Bridge & Iron Works, Des Moines, Ia. Bonds for \$9,500 have been sold for this purpose.

Sioux Falls, S. D.—Contracts have been awarded to the Beisch Sulzer Bros. Diesel Engine Co., St. Louis, Mo., at \$33,955, for oil engines, pumps and generators; Chicago Bridge & Iron Works, Chicago, Ill., at \$12,190, for the construction of a 350,000-gal. elevated tank; Fanebust Bros., Sioux Falls, at \$16,181, for the construction of a 1,200,000-gal. reinforced concrete reservoir.

St. Marys, W. Va.—City let contract to Foreman & Putnam, of Marietta, O., at \$6,894 to construct 400,000-gal. concrete reservoir.

Ellsworth, Wis.—Hector Coolsaet of Marshall, Minn., at \$5,865, awarded contract for extension to water works system to include cast iron bell and spigot pipe, hydrants and valves. J. F. Druar, Consulting Engineer, Commercial Bldg., St. Paul.

Fond du Lac, Wis.—Contract for constructing water system has been awarded to Geo. A. Mallory & Co., Kewanee, Ill., at \$3,190.18.

Kenosha, Wis.—The Water Commissioners have awarded contract to Greling Bros., Green Bay, Wis., at \$78,875, for laying the new intake for the water plant.

Powell, Wyo.—Contract for constructing gravity system has been awarded to J. E. Fisher, Denver, Colo., at \$57,000. Will include 7 miles supply line, distance about 15,000 iron pipe; 8-in. wood pipe for supply line.

LIGHTING AND POWER

Pomona, Cal.—Petitions being circulated for installing ornamental street lights in Lincoln Park and Kenoak Tracts.

Wilmington, Del.—Applications have been made for placing 68 arc, gas and incandescent lamps, installation of which will cost about \$2,980.

Pocatello, Ida.—City will sell immediately \$400,000 of bonds, proceeds of which will be used in construction of municipal electric light plant. Hydraulic engineer has been retained and work will begin at once. It is planned to have plant in operation in March, 1916.

Peoria, Ill.—The committee on lights to which was referred the matter of the establishing a municipal lighting plant with instruction to investigate and report, has presented report, recommending the submission of the proposition to the vote of the people. The report gives the estimated cost \$38,389, the same to be raised if endorsed by the people by the issuing of bonds.

Huntingdon, Ind.—Plans and specifications for 74 new light posts have been approved by works board. Posts are to be placed on Jefferson St.

Indianapolis, Ind.—The Merchants' Heat & Light Co. has been ordered by the Board of Public Works to place arc lights at the following places: Drover St., in front of Piel Bros' starch works; Fairview and 23d Sts.; Erie and Empire Sts., and 21st and Mansfield Sts.

Netawaka, Kan.—At an election held recently bonds to the amount of \$10,000 were voted for the installation of an electric-light plant.

New Orleans, La.—Frederick W. Bal-

lard, of Cleveland, has been employed by the Commission Council of New Orleans to make a preliminary survey of the city with the view of establishing a municipally operated electric lighting plant.

Sterling, Mass.—City may appropriate \$11,000 for extension of electric light and power line to Lake Washacum.

Kalamazoo, Mich.—An election will be held Sept. 7. Two bond issues, one for \$975,000 and another for approximately \$350,000 will be put before the people. The former will be for the establishment of a municipal gas plant and the bonds will be divided into \$900,000 worth of general liability bonds and \$75,000 general mortgage bonds. The \$350,000 worth of general liability bonds will be to extend the present municipal lighting plant.

Ellendale, Minn.—The installation of an electric-lighting system in Ellendale is under consideration.

Billings, Mont.—The Billings Engineering & Contracting Co. have been retained by the town of Hysham as consulting engineers for the laying out and constructing of a complete system of waterworks and electric lights.

Shelton, Neb.—At special election held July 27, citizens decided to issue bonds in sum of \$5,000 to purchase Shelton Electric Light & Power plant. Plant will either be enlarged or new transmission line constructed to Kearney or Grand Island.

Canastota, N. Y.—Canastota voted to expend \$1,500 for ornamental lights for the business section of city at a special election held Aug. 3.

Geneva, N. Y.—Election held Aug. 5 on proposition to expend \$18,500 for purchase of new combination motor chemical and hose wagon and triple expansion pump, a new hose wagon and a tractor. There will also be purchased 2,000 feet of hose.

Raleigh, N. C.—Arrangements are being made by the city of Raleigh for installation of an ornamental street-lighting system, covering eleven blocks in the business district. The city expects to purchase 70 or 80 one-lamp standards with ornamental arm for magnetic-arc lamps.

Wilson, N. C.—At meeting recently plans were completed for enlarging the municipal electric station so that day service could be granted. Contracts have been made with McIntosh-Seymour Co. and the General Electric Co. for engines and electrical equipment.

East Youngstown, O.—At recent meeting of council bids for the street lighting system were opened and the contract awarded to the Youngstown & Sharon Street Railway Co. for furnishing light and power for the city for a period of 10 years. The company sent bids for two, five, eight and ten year periods, for furnishing power for 100 watt lights for the residence district, 250 candle power lights for the white way, to burn until midnight, and 250 candle power lights to burn all night.

Decatur, Tex.—The street lighting committee of the City Council has been granted permission by property owners to string cables on the public square corners for hanging the new arc lights, and work of installing the lights will be started Aug. 1. Following this improvement, lights will be strung on East Main and East Walnut Sts.

Jourdanton, Tex.—After several delays, work has begun in earnest on the installation of the electric light system in Jourdanton. J. B. Hudson, of the firm of Hudson & Braden, San Antonio, has taken the contract from the Atascosa Ice, Water & Light Co. to install all lights for the city. The lines have been surveyed and the poles erected and are now in readiness for the wires.

San Angelo, Tex.—Improvements to cost close to \$50,000 are to be made to the plant and system of the San Angelo Water, Light and Power Co. within the next few months. This announcement was made by officials of the company. Among the improvements will be the installation of several large machines at the power plant.

CONTRACTS AWARDED.

Sterling, Ill.—The contract for installing the cable for the Morrison Telephone Co. has been let to the Electrical Construction Co. of Grinnell, Ia. There were several bidders present at the contract letting, the successful bidder securing it for \$4,850. Other bidders were George H. Glass of Pekin, whose bid was \$5,244, and John K. Stone of Minne-

apolis, whose bid was \$8,760. About 44,000 ft. of cable will be placed, part of it underground and part in the air on poles. The contract for the purchase on the cable will be let this week. Besides this work and cable the company will also let a separate contract for a switchboard and telephones that will involve a further cost of several thousand dollars.

Lexington, Ky.—The Harry I. Wood Co. has been awarded the contract on the new "White Way" in Lexington.

Paterson, N. J.—Bids for installation of a light and power plant have been received as follows: Bennett and Brown Electrical Co., \$3,482; for steam heating, Andrew J. Rogers, \$1,279.

Grove, Okla.—An election was held Aug. 9 to vote on the proposition to issue \$10,000 of bonds for electric light and water works extensions.

Niagara Falls, Ont., Canada.—Contract has been let for the construction at Falls View of electric lighting lines to the Carter Electric Co. of this city.

FIRE EQUIPMENT

Pomona, Cal.—Council has authorized purchase of two motorcycles for police department.

Atlanta, Ga.—Election will soon be called to vote on issuing bonds to extent of \$133,500, proceeds of which will be spent in purchasing motor equipment for fire department.

Galesburg, Ill.—Chairman of fire committee has recommended purchase of motor-driven combination truck.

Hiawatha, Kan.—City is contemplating purchase of motor-driven truck for fire department.

Fall River, Mass.—The Aldermanic committee on finance will recommend to the board of aldermen a loan of \$70,000 for the complete motorization of the fire department, and with \$15,000 already available the additional appropriation for fire equipment will permit of the entire motorization of the department. The matter of changing over from the horse-drawn apparatus to the motor equipment is to be left largely to the discretion of the mayor and the board of fire commissioners. Tractors are to be used on three trucks and chassis will be used for two bodies of hose wagons. Eight new pieces of apparatus are to be purchased, exclusive of the three tractors and two chassis. Figures compiled by the board show an estimated cost for motorizing the department of \$84,500.

Gloucester, Mass.—Council has appropriated \$8,000, which will be expended in purchase of an automobile pumping engine.

Saginaw, Mich.—Council is contemplating purchase of two pieces of automobile fire apparatus.

Wellston, Mo.—Wellston Business Men's Association has voted to subscribe \$9,000 for a firefighting apparatus. An auto fire truck and 1,500 ft. of hose will be bought.

New York, N. Y.—An allowance has been made by Board of Estimate of \$879,588 for completing new fire alarm system in borough of Manhattan.

Wilmington, N. C.—Following bids have been received on 1,000 ft. fire hose. (Lower prices are for double jacket hose and higher prices for multiple woven hose): Revere Rubber Co., New York, 70 cts.; the Diamond Rubber Co., Philadelphia, 80 cts.; the C. C. C. Fire Hose and Rubber Co., Canton, Mass., \$1; the Gutta Percha and Rubber Manufacturing Co., New York, \$1.05; Hudson Mechanical Rubber Co., New York, 58 cts.; the B. F. Goodrich Co., Norfolk, Va., through the Standard Supply Co., 68 cts.; Hewett Rubber Co., Buffalo, N. Y., 65 cts.; J. W. Murchison & Co., 76 cts.; Fabric Fire Hose Co., New York, Keystone brand, \$1.10; Department brand \$1; United Globe Rubber Manufacturing Co., New York, 50 cts.; Eureka Fire Hose Manufacturing Co., Atlanta; Paragon hose, which is the brand that Wilmington has been using, \$1.10; Red Cross, \$1; Monitor Multiple, 90 cts.; Peerless Jacket, \$1; New Peerless, 90 cts.; Patriotic, 80 cts.; Blue Queen, 75 cts.

Hamilton, O.—Council has passed resolution providing for issue of \$50,000 fire department bonds. With proceeds new fire house will be built, entire department motorized and a new fire alarm and police report system installed.

Yardley, Pa.—Borough has appointed a committee to look after details regarding the purchase of a chassis upon which will be placed chemical apparatus.

Winooski, Vt.—City is considering purchase of four additional fire alarm boxes.

Wheeling, W. Va.—Council is considering purchase of several more pieces of motor driven fire apparatus.

CONTRACTS AWARDED.

Stockton, Cal.—Council has awarded contracts for construction of two new fire engine houses to A. J. McPhee & Sons, at \$5,696.50 for the Rose St. structure and \$6,996.50 for the South Carolina St. house. Work will be commenced at once.

Monroe, La.—City has awarded contract for installation of fire alarm system to Gamewell Fire Alarm Telegraph Co. at \$4,510. Star Fire Alarm Co. bid \$4,788.

Gloucester, Mass.—Council has approved recommendation of fire engineers and has ordered purchase of Ahrens-Fox motor pumping engine and combination hose wagon at \$8,500.

Lowell, Mass.—The following bids were received for furnishing (a) a motor triple combination wagon, and (b) a motor combination chemical and hose wagon—Robinson Fire Apparatus Co., St. Louis, Mo., (a) equipped with Sewell Cushion Wheels, \$9,400, (b) equipped with Sewell Wheels, \$6,100; Mack Motor Co., Cambridge, Mass., (b) \$5,050; American-La France Fire Engine Co., Inc., Elmira, N. Y., (a) \$9,000, (b) \$5,000; Ahrens-Fox Fire Engine Co., Cincinnati, O., (a) \$9,300, (b) \$5,950.

New York, N. Y.—City has let contract to Empire Rubber and Fire Co. of Trenton, N. J., for furnishing tires for motor and other rubber apparatus for six months.

Wilmington, N. C.—City has awarded contract to Boston Hose Co. for 1,000 ft. fire hose at 60 cts. per ft. Other bidders were Eureka Fire Hose Mfg. Co., Fabric Fire Hose Co. and C. C. C. Hose & Rubber Co.

West Farmington, O.—City voted to purchase motor fire apparatus and has awarded contract for chemical mounted on Ford chassis to Hallock Engineering Co. of Cleveland.

Westmont, Pa.—Contract has been awarded to James Boyd & Bro., Inc., for type P.D. triple combination at \$7,500.

Cranston, R. I.—A meeting of the city's contracting and purchasing board was held July 29 in the City Hall and bids were opened for a long list of supplies asked for by the fire companies. It was decided to buy a chemical tank for the auto fire truck and the bid accepted was that of the Combination Ladder Company for \$183. Another bid from the Rhode Island Supply & Engineering Co. was for a little over \$200. A contract to furnish 700 feet of fire hose for the Cranston Volunteers was awarded to the Gutta Percha & Rubber Co. of Boston, and another purchase of 300 ft. of "Jersey Car Spring Hose" for the Vallone Volunteer Fire Co. went to the Rhode Island Supply & Engineering Co.

Winooski, Vt.—Contract awarded to C. C. Hose Co. of Boston for 400 ft. fire hose at 80 cts. per ft.

BRIDGES

Sterling, Ill.—Bids are being received for construction of a new bridge in Ustick township, known as the John Pape bridge and situated between sections two and eleven of Ustick township. The total concrete to be used is 62.5 cu. yds. and the total steel 4,702 pounds.

Shelbyville, Ind.—All bids for the repainting and painting of the county line bridge north of Edinburg have been rejected by the County Commissioners of Johnson and Shelby counties, meeting in joint session, and a resolution was adopted to put a new floor in the bridge instead of making any attempts to patch the old one.

Centerville, Ia.—County Board of Supervisors has rejected all bids for piping for county bridges and will purchase it in the open market.

Leavenworth, Kan.—Plans for rebuilding west side of 4th St. viaduct are being considered by City Commission. Estimated cost of repair is about \$12,000.

Lexington, Ky.—Plans sent by Louisville & Nashville Railroad Co. for improvement of the approaches to the Ayres Alley and Jefferson St. viaducts, approved by commissioners. The plans call for sidewalks, curbs and asphalt streets, and the total improvements will cost about \$13,000.

Topeka, Kan.—Plans have been submitted to city by T. J. Strickers, engineer for Kansas Public Utilities Commission for reinforced concrete arch bridge across Kansas River. Cost estimated at \$200,000, which will be borne jointly by county and city.

Attleboro, Mass.—Hearing will be held Aug. 19 on proposition to construct new bridge on Maple St.

New Brunswick, N. J.—City will issue bonds for sum of \$69,000 to cover cost of construction of new drawbridge to be erected over South River. Call for bids will be issued shortly.

Trenton, N. J.—State Department of Commerce is considering proposition to build bridge across Newark Bay Elizabethport to Bayonne.

Johnstown, Pa.—City will build either steel or concrete bridges at Haynes and Horner Sts. Plans are now being prepared by G. A. Flink, consulting engineer, Harrisburg.

Woonsocket, R. I.—The Board of Aldermen has authorized City Engineer Frank H. Mills to advertise for bids for the erection of two concrete bridges, one over the mill trench and the other two over Mill River, both on Clinton St.

Bridgeport, W. Va.—City will repair west end bridge, for which city engineer recently made an estimate of \$7,500.

Portsmouth, Va.—Commission on Roads and Bridges for Norfolk county has decided to erect wooden bridge to cost approximately \$20,000 over Farmers' Creek.

Elkins, W. Va.—Randolph County Court (W. O. Triplett, Kerens; A. W. Hart, R. L. Elkins, and Wirt C. Ward, Mill Creek) will erect five bridges at cost of \$12,000 (\$1,000 to \$7,000 each); reinforced concrete; bids to be asked, probably for September and March.

New Martinsville, W. Va.—Wetzel county, S. Myers, clerk, will probably build four or five concrete bridges within next year; appropriates about \$15,000 per year for bridge work.

Seattle, Wash.—Bids have been opened for construction of Fremont Ave. bridge as follows: Construction of substructure, Pacific States Construction Co., \$112,651.50; Hans Pederson, \$123,422; Beers Building Co., \$127,068. In construction of superstructure, Beers Building Co., \$154,601; Booker, Kiehl & Whipple, \$159,889.90; J. R. Wood, \$163,618. On combined construction, Beers Building Co., \$271,701.50; Hans Pederson, \$274,471; Zindorf and Lidral, \$308,660.50. Bids were also received in construction of 15th Ave. Northwest bridge as follows: Construction of substructure, Booker Kiehl & Whipple, \$92,145.50; Hans Pederson, \$97,556.30; Beers Building Co., \$101,987.60. In construction of superstructure, Beers Building Co., \$146,049; Booker, Kiehl & Whipple, \$146,366.50; Standifer Clarkson Co., \$148,944.75. On complete construction, concrete substructure and steel superstructure, Beers Building Co., \$238,416.60; Hans Pederson, \$240,790.30; Groff Construction Co., \$276,688.44.

CONTRACTS AWARDED.

Baird, Cal.—The Ross Construction Co., Sacramento, Cal., secured the contract, at \$28,235, for a 395-ft. reinforced concrete bridge across the Pit river, south of Baird.

Eureka, Cal.—To Frank H. Green, at \$2,480, for construction of reinforced concrete girder bridge over Salmon Creek on state highway, by County Supervisors.

Marysville, Cal.—Contract awarded Jenkins & Wells, Sacramento, Cal., for constructing 3 concrete bridges on State Highway lateral at \$14,216. Bridges will be 120 ft., 200 ft. and 80 ft. long, respectively.

La Junta, Colo.—Contract for constructing concrete bridge to have two 50-ft. spans has been awarded to Pueblo Bridge Co., Pueblo, Colo., at \$6,640.

Polo, Ill.—Fred Kaney, German Valley, Ill., at \$2,400, awarded construction of three reinforced concrete bridges at Monroe Center by County Commissioners.

Rockford, Ill.—Fred Kaney, German Valley, Ill., secured the contract at \$1,430, for the concrete bridge across stream between Ogle and DeKalb counties.

La Porte, Ind.—C. E. Andreas has secured the contract for building the Badtke concrete culvert at \$205, the Polarski culvert at \$220 and also the contract at \$155 for repairing the Grover bridge in Hudson township. W. A. Steigely has been awarded the contract at \$790 for the Huffman bridge, and at

\$395 for the Waelt bridge, both in Johnson township.

Lawrenceburg, Ind.—Contract for constructing superstructure and substructure complete for bridge over White-water river has been awarded to Oregon Bridge Co., Lebanon, O., at \$19,335.

Rushville, Ind.—The Rush County Commissioners have awarded contract for construction of the Thrawley bridge, steel span, to the Central States Bridge Co., Beecher St., Indianapolis, at \$2,092.

Muscataine, Ia.—Contract awarded to Standard Construction Co. of Davenport at \$2,913 for construction of culvert. Walter C. Klaffenbach bid \$3,027.40.

Radcliffe, Ia.—The contract for the construction of eight bridges has been awarded by the Co. Bd. of Supvrs. of Hardin Co. to N. M. Stark Co., Des Moines, at \$11,777.

Concord, N. H.—The United Construction Co., Albany, N. Y., at \$46,226, has been awarded contract for construction of the Mosquito Bridge over Winnisquam Lake between towns of Tilton and Belmont by State Highway Commission, F. E. Everett, Acting Commissioner.

Trenton, N. J.—Following bids were received for bridge construction. Low bidders were awarded contracts: Doctor's Creek bridge—Brown & Mackenthun, \$6,149; Rees & Taylor, \$6,379; Ginder Construction Co., \$6,500; S. J. Clark, \$6,714.42; G. B. Henrie, \$7,175; Charles Walton, \$7,290; Whittaker & Diehl, \$8,646; F. W. Schwieler, \$8,772; and Charles T. Eastburn Co., \$10,183. East Clinton Ave. bridge—Ginder Construction Co., \$1,407.80; Stuart Irven, \$1,974.70; G. B. Henrie, \$2,013; Whittaker & Diehl, \$2,297; Brown & Mackenthun, \$2,393; Charles Walton, \$2,700. Beeden's Brook bridge—Ginder Construction Co., \$2,018.70; Brown & Mackenthun, \$2,043; G. B. Henrie, \$2,320; Rees & Taylor, \$2,548; Charles Walton, \$2,664; Paul D. Kaufman, \$2,688; Whittaker & Diehl, \$2,849. Belgian block gutter—Rees & Taylor, \$671; Brown & Mackenthun, \$714; Reardon Construction Co., \$720; G. B. Henrie, \$817; Coleman A. Gibbs, \$975; Charles Walton, \$1,577.

Binghamton N. Y.—Case & Van Name, of Horseheads, were awarded the contract for the construction of the Miner bridge in Conklin Forks at \$996 which includes the building of new abutments.

Newark, O.—Contract for erection of steel bridge across Dry Creek has been let to Lane Structural Iron Wks., at \$4,000. To B. C. Patterson, at \$5.20 per yard, for placing 82 yards concrete for abutments.

Youngstown, O.—The County Commissioners have awarded contract for building concrete culvert on Mullin Rd., in Smith Township, the work going to the L. H. Young Co., whose bid of \$334.77 was the lower of the two submitted.

Tecumseh, Okla.—The Board of Commissioners of Pottawatomie County has awarded the contract for the construction of a bridge to the Kansas City Bridge Co., Kansas City, Mo., at \$5,570. Other bidders were: Missouri Bridge & Iron Co., \$5,872; Vincennes Bridge Co., \$5,741; Illinois Steel Bridge Co., \$5,764; Western Bridge Co. (suspension bridge), \$4,200. B. B. Wyatt is Deputy County Clerk.

Pittsburgh, Pa.—The county commissioners have awarded the following contracts: To William H. Johnston, at \$2,546 the construction of a bridge over Painters Run, in Mt. Lebanon Twp.; to John F. Howley & Co., at \$6,687, the construction of a bridge over Howes Run, in Fawn Twp., and the reconstruction of a bridge over Deer Creek in Harmar Twp., also was awarded to the Howley Co., at \$3,487. Repairs to the floor of No. 4 bridge, over Monongahela Run, was awarded to the John Eichleay, Jr., Co., for \$293.

Philadelphia, Pa.—The contract for repairing the bridge over Frankford Creek at Wyoming Ave. has been awarded by the Bd. of Pub. Wks. to M. & J. B. McHugh, at \$9,715.25.

Philadelphia, Pa.—Contract let to James D. Dorney for \$46,335, for construction of bridge over tracks of Philadelphia & Reading. Contract was awarded to McNichol Paving & Construction Co. for constructing bridge over Pennynack Creek at \$6,500. This bridge is of reinforced concrete and is 80 ft. wide.

Punxsutawney, Pa.—P. E. McGovern & Co. have been awarded contract by State Highway Department for construction of concrete bridge near Cool Spring.

struction of concrete bridge near Cool Spring.

West Chester, Pa.—The contract for the construction of a two-span, steel I-beam and concrete bridge over the west branch of the Brandywine Creek in E. Fallowfield Twp. has been awarded by the Co. Comrs. of Chester Co. to Dunleavy Bros., Coatesville, at \$6,500.

Longview, Tex.—The contract for the construction of a 120-ft. steel bridge across the Sabine River has been awarded to the Blodgett Construction Co., Shreveport, La.

Dallas, Tex.—Board of City Commissioners has awarded contract for constructing concrete culvert at Adair St. on Bryan, spanning Mill Creek, to Klein Brothers at \$1,670. McEachin & McEachin were \$28 lower, but contract was awarded to high bidder.

Bowling Green, Va.—Following contracts have been awarded by State Highway Commission: Bridge over Smoots Mill Pond and Big Swamp, to Southern Engineering Co., Roanoke, at \$1,406 and \$1,506 respectively, and bridge over Temples Mill Stream to T. J. McMahon, Roanoke, at \$1,388.

Montpelier, Vt.—The Rialto bridge contract has been awarded by city council to J. E. Cashman, Burlington, at \$16,805. Other bidders were: Penn Bridge Co., Beaver Falls, Pa., \$19,319; R. H. Howes Construction Co., Boston, \$19,683; Spaulding Construction Co., Suffield, Conn., \$22,400; E. N. Normandeau, Barre, \$22,620; M. A. Bundy, Burlington, \$24,737.

Seattle, Wash.—The contract for the construction of the Duwamish River bridge has been awarded to the Manhattan Contracting Co., Central Building Seattle, at \$26,594. Other bidders were: Albien Engineering Co., Seattle, \$29,972; Weymouth Construction Co., Seattle, \$28,695; Beers Building Co., Portland, \$28,888; H. S. Wright, Everett, \$32,179; Gerrick & Gerrick, Seattle, \$34,993. A. P. Denton is county engineer. Noted July 8.

Webster, Wis.—The contract for building the new 60-ft. steel and concrete bridge across Clam river has been let to Harry A. Rousch for \$1,680. Work will commence as soon as the funds are available.

MISCELLANEOUS

Stockton, Cal.—Bids will be received until 10 a. m., Aug. 10, for sale of municipal improvement bonds in sum of \$230,000.

Jacksonville, Fla.—Special bond election will be held Sept. 21 to decide on issuing bonds in sum of \$300,000.

Indianapolis, Ind.—The Board of Public Works has opened bids for contract for hauling rubbish and waste not included in the contract for hauling ashes. The bids were as follows: Indianapolis Hauling Co., which now has the ash contract, \$13,000 a year; City Cleaning Co., \$14,800 a year, and W. H. Tobin, Muncie, \$18,000 a year.

La Porte, Ind.—County Commissioners have asked Council for \$10,000 to be used in constructing comfort station.

Richmond, Ind.—County Commissioners will receive bids for one Broncho concrete mixer, power equipped, with capacity of 50 to 75 cu. yds. per day. L. S. Bowman is County Auditor.

Syracuse, N. Y.—Trustees of the Hospital of the Good Shepherd are considering the purchase of a new motor ambulance.

Greensboro, N. C.—County will purchase two additional motor trucks for use on county road work within next 60 days is report.

E. Youngstown, O.—Stanley & Schnelbel are architects preparing plans for construction of new municipal building.

Cranston, R. I.—Two issues of bonds amounting to \$75,000 have been authorized by the Cranston City Council. One issue is to be of \$25,000 of school bonds for the building of the new schoolhouse at Knightsville, work upon which has already begun, and the other \$50,000 is to be a part of the highway loan of \$100,000 authorized at the last session of the General Assembly.

Victoria, Tex.—City has appropriated and subscribed \$7,000 which it will expend in the construction of an incinerator.

Janesville, Wis.—City is considering issuing \$12,000 of municipal park improvement bonds.

CONTRACTS AWARDED.

Santa Ana, Cal.—Contract has been awarded to Riverside Portland Cement Co. for furnishing 50,000 barrels portland cement to highway department, at \$1.31. The Colton Co. bid \$1.34.

San Francisco, Cal.—The contract for constructing the second story of the Municipal Railway car barn at Geary st. and Presidio Ave. has been awarded by the Board of Works to James L. McLaughlin for \$26,747. In addition to this amount he may earn a bonus of \$1,200 by expeditious work. The price is less than the City Engineer's estimate. The Pacific Car and Equipment Co. has been given the contract to furnish a work car for the Municipal Railway for \$3,250 and the Westinghouse Co. will supply the motor equipment for it for \$2,343. The trucks will cost \$985 additional and the air brake \$287.50. The car will cost about \$7,000 when finished.

Augusta, Ga.—Contract awarded to T. O. Brown & Son for incinerator plant in Sixth Ward, with capacity of 25 tons per day, at \$9,000.

Boonville, Ind.—Miller & Co., of Indianapolis, were the successful bidders for \$18,950 gravel road bonds, bearing 4½ per cent for accrued interest and premium of \$12.50. Fletcher American National Bank, Indianapolis, bid \$6, premium, and Breed, Elliott & Harrison, Indianapolis, \$5.

Vincennes, Ind.—County Auditor Joseph I. Muentzer sold \$27,000 of bonds to the Meyer-Kiser Bank of Indianapolis at a premium of \$505. Other bidders were: Hanchett Bond Co., Chicago, \$81; E. M. Campbell Sons & Co., Indianapolis, \$328, and the Fletcher American National Bank, Indianapolis, \$57. The bonds sold are five-year 5 per cent levee repair bonds.

Greencastle, Ind.—Road bonds of \$15,880 were sold by County Treasurer Rynan. The First National Bank, of this city, got them on a bid of \$39 premium and accrued interest. Other bidders were: J. F. Wild & Co.; the Fletcher American Bank, Miller & Co., Breed, Elliott & Harrison, of Indianapolis. The Merchants' National Bank, Muncie, and James E. Burris, of Cloverdale.

Schenectady, N. Y.—Contract awarded to Standard Oil Co., at \$0.1511 per gal. for 6,000 gals. of gasoline for use at garage reduction plant.

Cincinnati, O.—Henry Niemes, 6115 North Ave., Pleasant Ridge, O., at \$2,650, awarded removal of boilers from old court house and installing them in Hamilton County Infirmary, by the County Commissioners.

Cincinnati, O.—County Commissioners have awarded contracts aggregating \$12,746 for reconstruction of part of the Workhouse for temporary jail. The chief bids accepted were: Stewart Iron Works Co., \$4,700 for jail apparatus; H. C. Hazen Construction Co., \$1,208 for brick and carpenter work, and Martin Daly, \$1,499, plumbing. There was no bid for the work as a whole.

Columbus, O.—Director of Public Safety B. L. Barger has awarded contract to Standard Underground Cable Co., Pittsburgh, Pa., at \$5,349, for furnishing 24,743 ft. of high grade rubber insulated lead covered telephone cable.

Springfield, Ore.—Geo. Vallier has secured contract to supply all sand and gravel required and to haul all structural material for construction of new bridge across coast fork of Willamette between Goshen and Pleasant Hill.

Pittsburgh, Pa.—Jones & Laughlin Steel Co. has been awarded the contract for the steel in Pittsburgh's new city-county building, for which ground was broken a short time ago. The bid was \$193,965, which was about \$34,000 below the estimated cost. All the steel used will be made in Pittsburgh.

Fort Worth, Tex.—W. F. Lowry was awarded July 20 contract for raising one of embankments at Lake Worth at the meeting of commission. His bid was \$640.45.

Houston, Tex.—To Horton and Horton for constructing wharf, cotton sheds and track at \$139,000; to Southern Engine and Pump Co. for two elevated tanks at \$7,000.

Milwaukee, Wis.—Pennsylvania Boiler Works, Erie, Pa., at \$2,330, awarded contract for furnishing two duplicate compact marine boilers with complete fittings and attachments by U. S. Light-house Inspector.